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Every Man his own Brewer.

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Every Man his own Brewer;

O R; A C O M P E N D I U M O F T H E E N G L I S H B R E W E R Y .

C O N T A I N I N G

The Best Instructions for the Choice of Hops,
MALT, and WATER; and for the Right Ma-
nagement of the BREWING UTENSILS.

L I K E W I S E ,

The Most Approved Methods of Brewing LONDON
PORTER and ALE. Of Brewing AMBER, BURTON,
WESTERN and OAT ALES. Of Good TABLE
BEER, and MARLBOROUGH, DORCHESTER, NOT-
TINGHAM, and BRISTOL BEERS.

A N D

Of manufacturing Pure Malt Wines. Of Fermenta-
tion; Casual Distemperature in Brewing, with the
Cause and Remedy. The Theory of British Fruits,
as applied to the Improvement of Malt Liquors.

Of AIR; its Properties and Effects on Malt Liquor.
Of the THERMOMETER, its Use and Application
in Brewery. Of FIRE, and its Action on Malt
and Vinous Extracts.

Together with

A Variety of MAXIMS and OBSERVATIONS deduced from
Theory and Practice. And some Useful HINTS to the
Distillery, for Extracting a Fine Spirit from Malt and other
Ingredients.

The Whole Illustrated by Several EXPERIMENTS.

By a GENTLEMAN, lately retired from the
Brewing Business.

L O N D O N :

Printed for the AUTHOR : And Sold by J. ALMON,
opposite Burlington House, in Piccadilly; and
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M D C C L X V I I I .





THE
P R E F A C E.

MALT liquors, though of great antiquity, were never known in any considerable degree of perfection but in England, and this perhaps in a great measure owing to our having the best materials, and using them properly, in the preparing of our Malt and Hops, with Coke, Culm, or Cannel coal, neither of which are the produce of any other country, and if imported from hence, esteemed too dear for the purpose.

ii The PREFACE.

IN the southern parts of Europe, malt liquors are very rarely attended to; and in the northern, where much used, the malt and hops are cured with straw, furze, or other such dry vegetables as emit a disagreeable smoke, and when steeped in the mash-tun, give the liquor a tincture extremely disgusting to an English palate; and I fancy there is, besides, some very eminent defect in their mode of brewing, and management after being brewed: for although I am a stranger to their methods, I am not so to the taste of their beer in various parts of the north, and from that taste conclude of their method, and conceive them much such kind of brewers, as Xenophon, in his return from Persia with the remains of the ten thousand Greeks found in Armenia: his account of their corn-wines is, "That it was in cisterns in their cellars, and their manner of drinking it was by suction through reeds, perhaps only an extract from the corn, simply, without any farther manufacture; as, like our oat-ale, to be speedily drank; or, as has been usual, until of late years, in Scotland,



THE PREFACE. iii

Scotland, to answer the purpose of a few days."

IN England, so far as Caesar was a judge of this matter, something more must have been done to their corn, drank by the Britons in that early age; for he says, we had plenty of vines for grapes, but only used them for our arbors; and that their corn-wine was in his opinion much preferable to that made from the grape, as it respected the human constitution: from whence one would be apt to conclude, beer was then made to some degree of excellence. That it was in great vogue as early as the conquest, we are well informed, and the general drink of the higher rank of the people, and would be so still, did not certain circumstances intercept that course, by the varying our order of food, from that which was simple and plain, to mixt dishes, and high sauces, which require liquors more light and sharp to properly digest: hence an affection for thin wines, or wine and water, Claret, Old Hock, Rhenish, &c. have assumed the place of beer in most genteel families; and in the cyder

iv The P R E F A C E.

cyder counties, that liquor is most esteemed.

THIS has induced me to consider what kind of fine light liquor may be made from corn of any species, that may be at once pleasant to the palate, answer the purpose of nearly as good a diluter as wine, and better adapted to an English constitution, without any dread of the gout, or such like consequences, the usual effect of thin wines. And I think this really practicable, from a particular circumstance that has occurred to my observation. I was once on an election, at a certain borough in Wiltshire, and, in the course of our canvass, drank sometimes to the amount of two quarts of beer in the forenoon, not only without sensible prejudice, but that it rather mended my health, and gave me brisk spirits. As I had not been used to drinking, especially in the morning, I admired at this, and found, on the most strict scrutiny, that nothing was used in this liquor but malt and hops, and that its happy vinous flavor was merely the result of good ingredients, well cured,
a fine

The P R E F A C E.

a fine chalk water, and not being too much boiled: I readily concluded, that something might be done to give a distinguished reputation to malt liquors, and operate as a counterbalance to the too free use of wine as a diluter; and I think I am enough master of the subject to make it so. But, as it is necessary, that all the various kind of malt liquors made in this kingdom, be so delineated, that different palates may have their choice; and as the London brewery supply at least one eighth of the people with the favorite brown drink called Porter, it seems to claim a right to the first section of this Work, next after considering the ingredients, from which that, and all other malt liquors are deduced, though on a different mode of preparation, and then the Brown Ales of the north in due order: after this, I shall enter on the finer beers of the south and west, and endeavour an investigation of their respective qualities, aiming to set the whole in so clear and intelligent a light, that if the reader has the least idea of the common order of brewing, and proper utensils prepared

pared for the purpose, he will be left entirely at his own election, to have light or full, strong or small, brown or pale beer; or the various mediums, wherewith to be merry or healthy, as may best suit his pleasure or interest.



INTRODUCTION.

THE rectitude of all kind of compositions, essentially depends on a thorough experimental acquaintance with the virtues and qualities of the ingredients, of which such composition is to be formed. In Medicine, the Doctors prescription avails the patient little, if he that makes up the dose is unskilled in drug or Botany. The Cook will not succeed better in his ragouts, &c. who labours from receipt, without a perfect mastery in the requisite materials: this is so obvious to common sense, that a writer would be inexcusable, that presumed to direct the Art of Brewing Malt Liquors to any degree of perfection, without first instructing the reader, inasmuch as the result of long practice can, how to make choice of proper ingredients.

The several kinds of Grain for Malt.

Malts are made, or, if you please, manufactured from various kinds of grain
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and pulse, as wheat, white-rye, barley of various species, oats, beans, pease, &c. and at certain times, and on particular occasions, have been used in part, or in the whole, in the Brewery.

Wheat has the most spirit and body, and was formerly the only grain esteem-
ed worth malting, and may probably be so still, if other reasons did not interfere than what relate to its qualities, as the best Brunswic Mum is made from this grain.

Oats, especially, those called the Short Small, are much inferior in quality to wheat and barley; but when well chosen and properly malted, make a much finer beverage, for our meals, than either of the above.

Pease and *Beans* are generally used as correctives, and to give a smoothness to liquors, as will be mentioned in due place.

Barley is the grain most generally malted for the Brewery; and as is supposed for this reason, that comparing its powers and price with those of wheat, it best answers a general purpose, tho' the Distillers seem to be of a different opinion. However, as the Brewers and
gentry

gentry in all parts of the kingdom concur in giving the preference to barley malt, it is of the kind that ought to be preferred, and of the soil for raising it, that I am now to speak.

Of the proper Soils for BARLEY.

Barley, being a much weaker grain than wheat, or more defective in power to force its way through strong clays, is most sown upon lighter ground; or, to prevent its catching the tincture of the common manure of horse-dung, is sown on the same ground after a crop of wheat, which has previously drawn off that foetid tincture, and prepared the earth kindly to receive it; it is otherwise sown on marled lands, on sandy loams, on stony or gravelly soils, mixed with a light black earth, on saponaceous chalks, or on fresh lands at first breaking up; the seed is usually chose from poor lands, thin of body, to improve and plump up on richer soil; this produces a grain thin of skin, but replete of flour, and is the kind most properly calculated for malting, and to give spirit and flavor to the liquor extracted; its appearance must be bright and clear, its form short and

B, 2

plump.

plump, and on feeling it be found hard and sound; in the heap well screened, free from chaff and darnel, or any other wild seeds; and after all, its real value known by its weight, which is readily computed by a small measure of different samples, always taking care, that such samples be perfectly hard and dry.

Factors in this experiment use a cubical inch measure, and thence compute the weight of a bushel; but as every one may not be so provided, or understand proportional arithmetic, it is more simple, and answers much the like purpose; if different samples are to be had to select the most weighty, supposing it to have all other right apparent qualities, which may be once more tried, by breaking the grain with your teeth, and seeing that the flour within be white and clear of specks, for Corn injured by weather, or other accidents, may look tolerably, and weigh well, yet very unfit to malt for manufacturing of fine well tasted beer; and having provided the brewer, the gentlemen, &c. with proper grain, the next consideration is, that it be well malted.

MALT from BARLEY.

It is not one in ten thousand who brews, that can be supposed to malt their own corn, nor one in a thousand that purchase corn to malt, so that, generally speaking, their confidence must chiefly be placed in the skill and integrity of the maltster, both as to weight and quality; as corn in the malting improves in measure, and ought to make a suitable allowance; as to the quality, various considerations take place, what fuel it is dried with; what the complexion of the malt you intend to use, and what kind of malt the fabricator is most accustomed to make, for its most probable he will only perform in one kind to perfection, be his skill and integrity what it may; and the plain way to know wherein his perfection consists, is to taste the several beers at different places, from his malt, I say at different places, because some may unskilfully misuse the best malt, and injure the credit of the maker; but if any one skilful brewer makes fine beer from it, it may be concluded in the maltster's favor, and that it is in your power with his malt to make

fine liquor, tho' it is better still if you find many in the same road. These are the plainest rules that can be given under this head, and if you grind the malt yourself, do not let your mill be set too fine, that which cuts the grain in half is sufficient, and best that it be quite cool before you use it; and here to avoid repetition, as I shall again be obliged, under the several heads of Brewery in different parts of the kingdom, to define the various kinds of malt in use, and the effects they produce, for the present quit the subject, and consider the next article in due order.

H O P S.

Hops seem to be the natural growth of this country, as they appear wild in the hedges all over the kingdom, and when in the bud are, by the country people, eat in the nature of asparagus; they are somewhat bitter, but have not an unpleasant taste; from whence I conclude the soil suited to the subject; but by constantly rising from the same root, and without cultivation, their powers necessarily weaken, and require a skillful hand to nurse them into full spirit and vigor.

The

The most noted countries for the cultivation of this product are Kent, Surry and Worcestershire, on the sides of Maidstone, Farnham and Worcester. The great marts for them are, Stourbridge Fair in Cambridgeshire, Weyhill Fair in Wiltshire, and the Buttrough of Southwark: There are, no doubt, good and bad in every county, but the most esteemed are from Farnham, the next from Maidstone, and the last from Worcester.

The cultivation of Hops is a very precarious undertaking, as they rise and fall often from ten guineas, or upwards, to two and a half the hundred weight, and the medium of six pounds but a reasonable profit.

Those who chuse fine pale beer, must use a fine Hop in its full flavor and perfection, and so in proportion to the complexion they propose for their beer; nor that a fine Hop will harm brown beer, but make it better; but a brown Hop, ill cured, will utterly spoil pale beer, both in flavor and colour; on the other side, an ordinary Hop may be used in brown beer, without the same apparent injury to the liquor, as the strong fire

taste of the brown malt, will probably overcome the indelicacy of an ordinary Hop.

The Hop, after great care and expence in the cultivation, is subject to be destroyed by the blight, and very much injured by bad weather, and at last often spoilt in the curing; when any thing of this kind happens, especially in Worcestershire, they are fumigated with sulphur to recover their colour; in this case great caution is requisite in the purchaser, not that sulphur will much injure fine beer, rather perhaps the contrary, so there be not too much of it, but the Hop will not have the due effect that might otherwise be expected from it.

Most persons who raise Hops have kilns of their own, and those who grow but small quantities borrow the use from their neighbours, so that any animadversions on that head would be idle, as the formation and use of them is perfectly known; but it may be remarked, that quick curing, and careful removing, contribute to the preserving them in their full spirit and flavor; because it will save the seeds that rest im-mixt among their leaves, and which,
if

if I may so speak, are the soul of the plant.

After what has been said, I presume neither the public, or private brewer, can be at any loss in what manner to select the commodity he proposes to use. The new Hop of like quality will always be preferred to the old, and bear a price accordingly; but the old, that is to say, of the last year, if in every other respect fine, is not to be despised; for which reason it may not be bad advice to those who use any considerable quantity, that when the price is very low, to purchase as many new Hops as may in part furnish them for the use of the succeeding year, as it seldom happens, that the rise is not considerable, whether a lucky season presents or not, owing to the management of those who make it their business to jobb the market, against whose influence there is no contending. And tho' it may be almost as impossible to direct the purchase of this commodity by precept, as to make a good Cook by a receipt; yet, if his senses are perfect, can feel that the hop be somewhat moist in the hand, see that it be full leaved, and within

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the leaves replete of seed and well colored, and smell that the flavor be rich and pleasant, he cannot be importantly mistaken.

L I Q U O R.

This is a term used in Brewhouses for simple water; and as I would not willingly affront those wise gentlemen by calling it out of its name, the reader, I dare say, will excuse me in calling it liquor, tho' perhaps not converted until it gets into the Brewhouse.

It is requisite to the extracting of spirit from malt, that liquor be as soft as possible; that is to say, to draw the more spirit and substance out of malt; but as in all extracts, our mode of reasoning will be the same, and while it is agreed, that the softer liquor extracts most, it is far from being agreed, that it does not extract too much, for so it has appeared to me in various instances in tea, rhubarb, &c. as well as in malt and hops.

I am speaking now of making a fine commodity, in which a due medium ought to be preserved, and must from long experience, and as it appears to me from common sense too, assume so much

of

of the dogma, as to aver, that if water be bright, and with a small addition of soap, will wash linen as well as softer water, such liquor is better adapted to the making of fine beer than softer water. At the same time it is certainly true, that those places that lye on the margin of chalk hills, ranged athwart this island, have much finer beer, with less care, than any other part of the kingdom; but this is not the kind of soft water in question, it is not the water of Thames, Severn, or Humber, or of any river in the kingdom, whose soft quality results from dirt and nastiness, nor can fine beer be made from them; tho' something of the kind may, when purged to a certain degree of sharpness, but never like what springs in a chalk well.

On the other side, there are waters in various parts of the kingdom so mineral tinctured, as not capable of being adapted to the Brewery.

The next preferable waters to the chalk, are those which spring from the rock or gravel; either of these may sometimes prove too sharp, more especially for common brewers, who chuse

not to leave in the grains any substance for the hogs; but in this case the remedy is very easy and natural; for if such water be drawn into cisterns or tubs, two or three days always makes the necessary difference, and if well or cistern be lined with chalk-stone, this super sharpness instantly disappears; and so it will in boiling, for then the spirit of the dirt evaporates, and the meer earthy parts remain at the bottom a kind of *caput mortuum*.

It is hence plain that river water, however it may answer the purpose of the common brewer, is not well adapted to that kind of brewery, calculated to the use of genteel tables, nor will ever make such fine beers as are manufactured from the chalk springs; but as this argument will be better understood, in the course of the future sections, and all that can be farther said as to the choice of water, let it in general be as free from harshness as possible, but at the same time perfectly bright, as the separating it from dirt and nastiness will permit; and be assured, that it is absolutely impracticable to make beer stand the glass, that is brewed

ed from a muddy stream, time, fermentation, and finings may throw the foulness in some measure down, and it may, like the best London Porter, look tolerably clear at the bottom of a well scow-ered pewter pot, or clean silver tankard; but bring this same liquor in a glass to the candle, and then the *deceptio visus* becomes too apparent; the seeming fineness is nothing more than a glare thro' the liquor from the burnish of the respective metals.

The next thing to be considered in due order is the form, fitting up and furniture of a Brewhouse, that may at once answer convenience and utility.

THE BREWHOUSE.

The ingenious reader is here to take notice, that in dissertations of this kind, it is not necessary to give more than one form and disposition, from which any proportional, greater or less, may by the common rules of arithmetic be readily deduced; and in the next place, to consider that situation will ever vary the given plan; as we cannot construct a building in what form we like, or special

erial rules direct; in such places, as we have not ground at command, and this will likewise in some measure vary the internal disposition in the placing of the respective vessels, and some of the conveniences be necessarily wanted, and some not in all places equally requisite.

The best form of a building for this purpose, where ground is at command, is an oblong square, and in the proportion of sixty to ninety feet, or the breadth two thirds of the length, which will, whether the proportions increase or decrease, answer every beneficial purpose, for the disposition of the requisite furniture within. Antecedent to the building, it is first necessary to consider from what distance you are to obtain the water you desire for brewing, in what manner it is most conveniently, and at least expence to be conveyed to, and in what manner to be received at the brew-house, to be ready and fine for use; as this not at first regarded, may in the future occasion much inconvenience and expence, and perhaps after the charge of building make the whole useless. In London, or where water is laid in to all parts in plenty, this is not a material
confi-

consideration, other than having a proper receiver for it to fine; and for the liquor called Porter, that is not esteemed absolutely requisite, as such is not intended to be fine beer; but in the country it is quite otherwise, whether very fine beer be intended or not.

The judgment to be made of this depends on the distance of the water, and how far it may be afforded to lay pipes for its conveyance to the Brewhouse; for as to the raising it to a proper level, by wind, fire, or horse engine, is quite insignificant, as the expence for particular use is now so low as not to merit regard, and may serve various other purposes in the house, laundry or garden.

The water being considered, the scite of the Brewhouse must be as near as possible north and south, at the south end a dead wall, against which on the inside to place one or more coppers; on the outside and above the level of the coppers is to be constructed a brick cistern, well cemented and stuccoed or plaistered within, to receive the water from the engine, with leaden pipes through the walls to the coppers, and with brass cocks as of course; in this cistern the
water

water must stand some time to fine for use; no certain time can be given, as it must depend on the nature of the water, the order of the weather, and common observation, when proper for the purpose, only that it may be as fine as possible, and as little time in the cistern as may for that end be found necessary. This cistern, where much water is to be used, may be of thirty feet by ten in length and breadth, and the depth equal to the breadth, and in that proportion for larger or smaller Brewhouses; from whence may be readily computed the quantity of water required to any apportioned building for the design in question, this being calculated to that of ninety to sixty feet with proportional vessels.

The placing of the copper determines all the rest, as it must be something above the common level of the mash, tun, and cooler, in order to the readier conveyance of the liquor to the mash, and of the wort to the cooler.

In great Brewhouses the medium height is twelve feet from the ground, and is well apportioned to the largeness of their vessels; and as the mash-tun
must

must stand above the receiver; and as the upper cooler must have another under it, and that above the vessels that are prepared to receive the wort.

The building, as to the length and breadth, or as a proportion thereto, is previously given, but the height remains, and must remain indeterminate, only noting, that as the malt should be ground above the mash-tun, and above all, as much light and air as possible; any ingenious man constructing such a building, may form a very near judgment what height may be proper; the break of the side walls up to the roofing, whether by lattice work, or clap boards eaving over each other, must be above the malt mill, from six to twelve feet, according to the other dimensions of the building; and as to the apertures below by single or double doors on the north, east, or west sides, such simply depend on what is to pass through them most conveniently, and of that, the designer only can make a proper judgment, because he can only know what opening may be wanted.

The Brewhouse prepared, and all the requisite ingredients furnished, our next

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consideration is to enter into the practise of brewing the various kind of malt liquors in their utmost purity and perfection freed from those bad arts, which it is even dangerous to expose in print, least it should infect more than are yet concerned in such pernicious secrets.

The malt liquors that chiefly circulate in the home markets, are, London Porters, Burton and Yorkshire Ales, Dorchester, Marlborough, and Ramfbury Beers. Those principally exported are, the said London Porters and Bristol Beers; and as these are all calculated for the markets, and, tho' generally esteemed, cannot be expected to equal the excellence of such as are for domestic use, for the service of great families, where this perfection springs merely from skill, and wholesome ingredients.

The beers brewed for domestic use are as various in their complexions and qualities, as those for the market, or as custom or fancy happens to dictate. In general, the northern taste, is Brown, or Brown and Ambers mixt; the southern, Amber, Amber and Pale mixt; or Pale only; and the mode of brewing, either of these simple or mixt, will

will be noted in due order, and their respective qualities properly investigated; and here I shall beg leave to make a brief digression.

In my memory, brewing for the markets, was within a very narrow compass, but has extended, by degrees, on its being apparent, that at a low duty, brewers could make their beer better, and sell it as cheap as it could be brewed in private families, free from casual expence, hazard and trouble, and the revenue at the same time considerably benefited: But as common brewhouses increased in the metropolis, and were dispersing all over the kingdom, the government, as in a fit of the spleen raised the duty; put a full stop to these growing improvements, until the difference between such private families that can, or that cannot conveniently brew for themselves in London, is eight shillings in every thirty five; and in the country, the same in every thirty two gallons of strong beer; and it is in a pursuit like this, or somewhat similar, that our internal trade, like the prisoners on the iron bed of the Attic robber, is put on the full stretch, wasting its genial spirit, and gradually declining

ning into ruin. When it was more than probable in this particular case, that had common brewing been permitted, by means of a small duty, to have taken its free course, a better supply would in time have resulted, and common justice so far have taken place, that all would have paid alike for strong beer; I would not willingly accuse men in power for having heads finely turned for calculation, any more than prophetic foresight; but if it be true, as is but too evident, that our internal trade in general is on the decline, and high duties on the manufactures, and on the manufactory materials, foreign and domestic, the true cause of that decline, the consequence is likewise very evident, that both trade and supply will dwindle into nothing together, and prove to some purpose the folly of high duties. I shall now return to my subject.

THE





The Philosophy of Brewing;

OR, A

COMPENDIUM

OF THE

ENGLISH BREWERY.

Y Philosophy here, is not intended that mode of speaking in words, and terms, unintelligible to nine-tenths of those, who may desire a thorough acquaintance with the subject, but merely that plain sense and reason of things, whence springs an accurate knowledge of the virtues and qualities of the several species of Grain, Vegetables and Seeds that may be used in the Brewery, and how the same may be in various cases applied for Health, Pleasure, and Profit.

Wheat is the prime seed, for the manufactures of Bread, Beer, and Spirits;
and

and the flour of infinite utility in a number of occupations, not at present to the purpose. It has been slightly mentioned before, but here more maturely to be considered, because, tho' at present but little regarded in the brewery, is yet an important article.

The chief countries for raising this grain, and that lye to the northward of the great range of chalk hills, are the counties of Huntingdon, Northampton, and Leicester, most generally clay soils, with very few stratas of marle; and as the lands are necessarily to be manured for three successive crops or more, and wheat the first of these, it follows, that such manure must be used as such countries can afford, which is most generally horse-dung, with such other mixtures as may be had, none of which are proper for any grain to imbibe, that is to be used for fine beer; and so far the disuse is accounted for; but where this grain is raised on marled lands, or fresh ground, the sense of its foetidity vanishes, and we come to consider it in its pure and natural state. That it has more spirit and body than barley, is, I presume, not questioned, but in what proportion, nothing



nothing but experiment can announce, and that evinces it to be nearly on a level with the customary difference of price at market, tho' that variance often depends on other circumstances, and is not an express rule; but it has been found, and the distillers know well, that a bushel of malted wheat, is equal to one and a half of barley; and here the benefit of using wheat in preference is evident, as it saves one third in the expence of malting, which I suppose is so far the same in the brewery, as in the distillery. This is an evident advantage, the hazard in using it for beer, as tainted by the manure, is a sensible objection; but as that is possible, in many places, to be avoided, I think is not an absolute objection. The next objection I can say from experience is a mistake, which is, that it draws off from the mash, thick and mummy; and so it may, if good management be wanting; but as eight bushels of wheat malt make the same quantity of beer as twelve of barley malt, and the consistence not more clammy, the liquor with due care in the mashing will run off equally fine, from the one, as from the other. The white wheat,

wheat, pale malted, is in this case to be much preferred, as it will work more free than when quick dried, and will preserve somewhat a better color than the red wheat; but if the land on which it is raised be not considered, the beer will not be agreeable to nice palates, and herein is all the hazard.

Oats are much on the other extreme, they have neither in them the harshness of the barley, nor mumminess of the wheat, the flour sweet and delicate, and when properly selected and tenderly malted, bid the fairest of any to act as a vinous diluter, and may, well managed, answer a better purpose for digestion than light wines, and much apter for an English constitution; they must not be thrown off with cold water, as is customary in oat ale, they must be mashed warm, and if possible the whole thrown off into the receiver, with the liquor only once run through them, quickened with fresh currant juice, or white bulaffes, boiled about fifteen minutes, and worked off like other beer, with as little yeast as possible, this will be a real wine,

The fruit juices as above, may be preserved with virgin honey, or loaf sugar, as most convenient to seasons of brewing, when not to be had fresh; and about a pound of either is sufficient to a hoghead of beer; they will assist as well to the flavor and fineness, as to the quickning it for use, and at the same time essentially contribute to the correcting that scorbutic dryness, so common to all malt liquors, owing to the heated quality of the grain in malting; these fruit juices may be safely thrown into the boil, and will assist all future fermentations in the wort, and in the tun; and as to the method of using or applying hops, a necessary quantity will be seen in the next section.

What may be said upon Hops different from other People.

It is not the Brewers business to raise or cure Hops, but to know when they are good, and how they are to be properly used.

The running the liquor through part of what is to be used, to prevent foxing may be well enough, but the boiling them in the gross seems a mistake.

C

Hops

Hops are allowed to have two distinct qualities, as almost every thing in nature has, and such qualities diametrically opposite to, and as correctives to each other a kind of counterbalance, that neither may be too prevalent; and one being the soft saffrony quality we esteem homogenous, the other the reverse; common sense seems to dictate an absolute separation; but how this is effected by boiling, I must confess I am not chymist enough to discern.

The first quality to be extracted, is a soft, pleasant, bitter and aromatic taste, the residue of no real use, either as to health, pleasure or preserving the beer. The extract is to be made by decoction, in a machine commonly used for extracts, by an equal degree of heat; and the sufficiency of the extract, or separation of qualities, to be estimated by a very easy experiment, by three trials; as suppose it be found, that the extract in gross may be made in six hours, the medium in four, and the latter, or the most proper to be used, in two hours, the distinction will be given by the taste; and this experiment evince, what it is that gives beer the fine, and what the
foetid

ferd flavor, and then every one may apply them as may best suit the purpose.

The general rule for hopping, is as to the time of beer being to be kept, and proportion of barley malt to be used; that is to say, to every quarter of malt, for so many months as you intend the beer to keep, for each month one pound of hops.

If hops be used by decoction, and properly drawn, the extract from one pound is amply equal to the like quantity used in the gross; and the different manner of employing it only this, that instead of boiling a considerable time in the wort, it be only thrown in about five minutes before the wort is run off into the cooler, taking care that it be of such a degree of heat, as not to check the boil; and when hops are well chosen and so used, neither the public brewer, nor private family, if their malt be perfect, need fear having a fine flavored beer. And the choice of malts are to be selected from the following table, which is only intended here to shew, what extracts will fine spontaneous, and what must be precipitated, or made fine by art, in proportion as they

are lower, or higher, slower or quicker dried, as the same are usually measured and determined by the thermometer, in every body's power to experiment; and which, after having once tried, an attentive observation will sufficiently answer the same end. This is very far from being a needless curiosity, as it is extremely proper for every one that brews, to make a certain judgment when his beers will come about, for use, from a natural effect, or by art. And as it is agreed, that extracts from pale malts, gradually perfected, will in proportion be sooner fine than such as are malted quicker, and as there are various degrees of malts from very pale or white, to very brown or black, and as we cannot always command our choice, it is very necessary at all times to know, how such as can be immediately got may answer what we intend. There is no depth of philosophy, or uncommon cunning, requisite to understand this, but only that kind of ordinary attention, necessary for every one that may attempt brewing to any degree of perfection.

The TABLE.

Malt, its degree of dryness,	The time Beer will be in order,	Fine in the natu- ral way, or by precipitation.
124 Pale Yellow	60 days	} These fall na- turally fine.
129 Bright ditto	120 ———	
134 Amber	4 months	
138 Light Brown	3 ———	
143 Brown	4 ———	} Bright by pre- cipitation in a short time.
148 Middling	6 ———	
152 High brown	12 ———	} By precipitation in that time.
157 Dark brown	18 ———	
162 Brown, with black specks	2 Years	} These will fine to some tolera- ble colour but never bright.

These are hints sufficient to guide any one in the choice of his malts, as it respects the color of his beer, and the time it will be fit for use if judiciously brewed; and the experiment is to be made in the kiln as soon as the malt is perfected, and used as soon after as possible to preserve the genial spirit. It has been said before, what quantity of hops are requisite to each quarter of malt, and how the same are to be prepared; but here it must be considered,

that if the beer is to be sent into a warmer climate in the cask, one third more hopping is absolutely necessary, or the increased heat will awaken the acid spirit of the malt, give it a prevalency over the corrective power of the hop, and ferment it into vinegar: to avoid this superior expence of hopping, the London and Bristol beers are usually drawn off and deadened, and then bottled for exportation; this really answers the purpose one way; but whether counterbalanced by charge of bottling and freight, &c. those who deal in this way can best determine. By a parity of reasoning, beer brewed here in the summer require more hop, than in spring or autumn, and by a continued parity, less in the winter than in warmer seasons; but as nothing but necessity can induce brewing in either hot or cold weather, this is only hinted where such necessity presents.

The London Brewery is now arrived to a certain pitch of excellence, and with the most ordinary malts and hops can, and do sometimes manufacture by much the best beer in the kingdom, and would be every where so esteemed, did not

not avarice too often gain the ascendant, and put the brewers upon schemes to spoil their own commodity by blending different beers, and using other artifices, that makes them oftentimes something more than disagreeable; but as their bad practice will neither alter the nature of malt and hops, nor demean their skill when they employ it justly, this brown beer, usually called Porter, will ever, when properly brewed, command a preference, and is most in order to lead the way to the best instruction in the Art and Mystery of Brewing malt liquors.

*The Method of Brewing LONDON BROWN BEER,
under the Name of PORTER.*

It has been customary in the practice of brewing, to run their liquor out of the copper into the mash tun, to await the steam flying off until the brewer could see his own face in it, and then pour in the malt; this being an uncertain course, and subjected to many inconveniencies in the mashing, a quite different, and much more estimable method is now pursued, by first judging of the requisite heat in the copper by

the thermometer, by first supplying the mash tun with a proper quantity of malt, and by running the liquor into the false bottom, from whence it springs up through holes in the mash tun, and intermingles with the malt; it is then raked to open and separate the grain, and then finished with oars or paddles to perfect the separation, and give all the viscous juices into the decoction, the oars move perpendicular, as the rakes in an horizontal line, and so these two various operations act to full effect.

The approved custom is to rake half an hour, and oar one hour, in the first mash, and to allow the same space of time, viz. one hour and a half for settling.

After this time for settling the grist at the bottom of the tun becomes more compact, the liquor is a longer time running through it, consequently draws off more from the body of the malt, and becomes more clear and transparent.

The infusion having now received all the power from the mash the adapted heat could give, it is then drawn out of the tun, and the thermometer is set at the under back cock, from whence to form a judgment of the rectitude of the process.

The

The water should as near as possible boil for every mash, the fire then damped, and the water lowered again with as much cold, as will reduce it to the degree of heat requisite to the mash.

This is the practice, tho' I am at a loss for the reason why it should be first heated so high, and then cooled to a medium, since, as the brewer works by a thermometer, he might ascertain the heat without this double trouble; but so it is, and I suppose there may be a reason for it out of the road of my apprehension, and my business here is only to state facts.

As to the number of the mashes to be made from the same grist, whether two, three, or four, is an arbitrary circumstance, not always the same, but the common brewers lengths for this species of beer are at a medium, two barrels and a half to each quarter of malt, each barrel 36 gallons; I am more particular in this, as the country barrel is but 32 gallons.

It seems needless to mention here, that the extract from the tun is passed into the under back, and thence pumped into the copper, except that in its course it passes through a certain quantity

tity of hops in nets or wicker baskets, to prevent the acid of the malt rising into a ferment out of time and foxing the liquor.

Worts in this course are most usually boiled to a heat of 212 degrees or upwards, and the more above that the stronger the liquor is; the person who would brew by some rule, and does not conceive the meaning of this, must excuse me if I say, that nothing but the use of the thermometer can ascertain the proper degree of heat, and if not used, instruction this way is vain, as all else must depend on practice; and as the knowledge and use of the thermometer is easily obtained, and the instrument every where to be had, I will attempt in some part of this work to give a concise and plain description of its use and application to this subject, such as a very moderate head may understand, and ingenious mind find various uses for.

As the wort issues from the copper it loses more heat than at any equal space of time afterwards, and as the air differs sometimes several degrees in the same day, if the wort in the cooler was suffered to continue until the return of a greater heat in the air, it would expand, and

and be put again in motion, and this probably produce a certain degree of fermentation carefully to be avoided, and is what the brewers term the *backs being set*.

This is a plain reason why wort should not be permitted to continue so long as to be subject to this injury, as it may happen in little more than twelve hours; hence it is likewise plain, that the worts should be spread thin in the cooler, so as to be drawn off in that space of time; in the summer it is sufficient if the floor of the backs be covered; in winter may be allowed the depth of two inches.

Worts often, by casual defects or irregularities in the coolers, make a true judgment of their degree of heat, or temperature, uncertain, and in such case difficult to determine by the thermometer; in such case the heat of the hand may be applied, and the best guess that can from thence be made; it will cool something as it runs into the working tun, and that difference must be allowed for; in general, what state the worts, for the several species of malt liquors ought to be in, when the yeast is applied,

ed, may be nearly ascertained by the subsequent table, calculated to the heat of the air in various habits, and when their state is so untoward for proper fermentation, and can't by any other means be reduced in time to a proper degree of coolness, the air may be admitted about an hour before sun rise, (as then in its coolest state.

The TABLE.

Heat of the air,	Common small,	Keeping Beers,	Amber or Ales.
25	75	59	55
30	70	56	54
35	65	53	53
40	60	50	52
45	55	50	51
50	50	50	50
55	}		
60			

I must confess, that there seems to be some mistake in this table; but as it is the calculate of an ingenious man, and perhaps false printed, and as an investigation would be too curious for the present design, I must wave my opinion until experiment shall evince its rectitude,

tude, or give me opportunity of forming another more correct.

To attain a certain degree of heat, adapted to the state of the air, is doubtless an important point, and could we assure it, the most tender part of the whole process would be established on a stable basis; as it is I can only say, that even an attempt of this kind merits esteem, and if correct, honor; but at last I am apprehensive, that the changes of air in this climate are so sudden and common even in the space of twelve hours, almost every day, that was a table calculated on the most absolute certainty, it would in this case but little avail us.

Yeast is used to produce fermentation, and that from the strongest beer the best, and so in proportion. The quantity necessary, may be from three pints to a gallon or upwards, as the wort for different beers may require, and this only to be judged of from its nature and operation, as it is not to be all applied at once, but the fermentation so gradually to be supported, until it has passed through a due course of working, and then when fallen from its prime altitude
about

about half way, is as the brewers term it, to be cleansed; that is, drawn off into the casks, and there prepared for a new fermentation; as the preceeding will by that means be checked, it is therefore necessary on the cleansing, that some more yeast should be added to the run before removal; and the beers before they be thus divided, should be well stirred for at least half an hour, especially in strong beers, because of their greater tenacity, than liquors of a less degree of strength, even to an hour if very strong, as it will by that means be more ready to ferment again in the casks, and one sixth part of the yeast reserved for this special purpose. And it is only to be observed, that when after long working the head sinks in the middle, is more solid, and the colors vary to a higher yellow or brown, the wort is then in a proper state for cleansing.

Beers brewed for keeping, without precipitation or fining, pass through the first process of ferment till so attenuate, or broken, that the liquor becomes light, the yeast head descends to half its greatest height, and a vinous smell ensues;

ensues; it is then in a proper state for cleansing.

As to beers that require precipitation, as produced from quicker dried malts in various degrees, as Porter, &c. the top of the yeast when rose to its height, that part which appears foul is to be skimmed off, and the remaining head from time to time gradually beat into the wort, as much as possible, to separate the cohesing particles, and fed with fresh yeast; the head is to be beat in every two hours for some small space of time, until reduced to the lowest it is capable; the whole of this process then, depends on observing when the head ceases to rise to its accustomed height, and then to examine from the bottom, whether the lees are formed into large white flakes, and readily subside, the sweet of the wort gone off, and the drink become vinous, the head is to be beat in as before, and then in a proper state for cleansing; the fermenting in winter or summer is only attended with this difference, that in summer two thirds of the quantity of yeast will feed it.

The Minutiae of BREWING.

This intends only the mechanic operation, the regular and ordinary course of the process, distinct from a philosophic enquiry into the qualities of the respective materials, and essentially concerns those to thoroughly understand who are not practised brewers, and is calculated to avoid a variety of repetitions, or of saying the same thing over again, when we come to distinguish the several methods of brewing, as to times, seasons and malts.

The first process is with the water in the copper, which is to be thinly spread over with malt dust or bran, to prevent in some measure evaporation. The degree of heat proper for the mash, is most correctly known by the thermometer, but where that is not in use, the heat to be acquired is nearly to a boil, and computed by the bubbles of air breaking through the cover of the surface, it is then much too hot for the first mash, and when let into the tun before the malt, because, without the thermometer, you can only judge of its proper degree of heat, in the old way,

way, by seeing your face in the water, then about seven eighths of the malt intended for the whole gradually shot in, sufficiently cool after being ground; the mash is after this, and as the malt shoots, to be moderately dispersed by oar or paddle, for an hour at least, and to have an equal time for settling. Artists use the rake first half an hour, and the oar an hour, and allow the same time for settling, as is remarked in the preceeding section; the rake is certainly best at first, as it readily separates the grain, and prevents a possibility of clotting, as the rake or oar is employed, and the mash cools, more liquor should be gradually let in from the copper, until, at the conclusion of stirring, a sufficient quantity is furnished for the first wort.

When that is supplied, the copper must be replenished for the next mash, and when the first wort is run clear off, let in something warmer than in the first, in which case your judgment must be meer guess-work without the thermometer, but the feel by the hand will in some measure determine it tolerably well.

well, after a little practice, but for various reasons never be certain.

In the running off the first mash, about one fourth of the hops intended for the whole must be put into a fine net, fastned to the mash cock, or some other way so placed, that the liquor may pass through the hops in its passage to the receiver, and carry the prime flavor of them with it. This is done to prevent the acids rising in the wort to a ferment out of time, and tainting or foxing the drink, which without this precaution commonly happens, and the same hops are to continue for the like purpose in the second running.

When the second mash is provided from the copper, the first wort is to be pumped or laded into the copper, and here no rule can specially direct, only in general that the time of boiling, and quantum of the hops to be used, is to be proportioned to the time of keeping and strength of the wort, more malt requires more hops, and more hops more boil, as longer keeping is required. The medium is one pound of hops to one bushel of malt, I suppose both good of their kind, that the hop feels well in
the

the hand, with a quick aromatic flavor, and the malt sweet and floury; if such drink be boiled one hour, at eight bushels to the hoghead, and brewed in October, the season kindly, it will very well answer to a year's keeping, and of this proportion, higher or lower, a tolerable judgment may be formed.

It is usual among the great brewers to blend their old and new beers together, either when overstocked, or when deficient of such as are proper for the tap, as so blending bring them to a medium between mild and stale, it is true, that drinks this way will never be right, though perhaps not totally unwholesome, necessity seems to have no law, the brewer does not chuse to lose his over stale beer, and proceeds in this manner, in the guise of new beer intended for blending with the old, instead of eight he uses fourteen pound of hops, and this quantity being presumed a proper corrective, the new is then started into the stale, and when blended, is intended for keeping, from six to twelve months.

The process of the second wort being the same as the first, they are both in the ordinary course, after each other from

From the copper, to be run off into the upper cooler back, and there laid as thin as possibly the extent of the back will permit.

The manner of their hopping may be, either by a separate decoction, or as gross in a bag, when the decoction is prepared separate, the quantum thereby extracted of pure bitter may be equally divided into the two boilings, each about five minutes before the drink is run off into the cooler. This will be the best liquor, but as most people chuse to have as much as they can out of the hop, and think they procure it by boiling, they are so to use it to what degree they please.

When the two boilings are blended together in the wort tun, the next consideration is the management of the ferment or working.

I must here premise, that the rule prescribed, of only two extracts, is on a supposition, that good small beer is to follow from the same mash; and as in that case, the two extracts will be of greater body, than if three had been drawn in proportion, less yeast will be required in the fermentation nearly two eighths

the eighths, so that if eight pints is usually
thought requisite to a quarter of malt
thrice drawn, six will in this case be
sufficient, if brewed in October, or
when the natural state of the air is in
the like degree of warmth; and in the
summer four pints usually sufficient, and
the small beer requires only one third
of the quantity adapted to the strong.

One other observation is extremely
requisite as to yeast; it is to be care-
fully regarded from what fountain it
proceeds, as there is a very material
difference in such as are from small
beers, and so upwards to very strong, the
strong being much superior for the pur-
pose; therefore, when it is said that
such a quantity is proper, it is intended
it should be above the common medi-
um, and if possible from the strongest
beer, for on the strength of the yeast
depends the proportional quantity, as
well as upon the quality of the air, and
season of the year; nor is the whole
quantity proper to be used at once, as
too violent a fermentation will break the
air bubbles that spring in the ferment,
and destroy the gradual action, which
can only preserve the due order of this
process,

process, intended to attenuate the parts to throw off the most pungent, and cause the heavier to subside. There is often various heterogeneous matter, by the working thrown up to the head of the wort; and if not skimmed off, will in the event subside, and foul the drink, or give it an ill taste. This must be carefully attended to.

When the fermentation is determined in the tun, the residue of the yeast is to be thrown in, and the wort to be moved with scoops, or such like instruments, for about an hour, and then cleansed into the casks, where it will by this method obtain another free fermentation.

The yeast being formed of the coarser oils of the worts, therefore great care should be taken, that the cleansing be effected when the head is fallen half way from its prime height, as if suffered to sink lower, part of these oils mix with the beer, and give it a flat greasy taste, in the Brewers technic, termed *Bitten*.

On the contrary, if cleansed too soon, as not having been sufficiently fermented, precipitated their lees, or thrown up their

their noarfer oils, the vinous quality will be less, and the liquor heavy as all brewed ales, and in the brewers phrase are said *not to be sufficiently opened.*

The first token of fermentation is a clear white line composed of slight air bubbles, ranging round the side of the tun, it is then said *to have taken yeast.*

When these are extended over the surface, as they gradually spread; the wort is said *to be creamed over.*

As these continue to rise they form a thin superficies, the fermentation increases more on the sides than in the middle, by which it is perpetually re-belled, by the wort parting from the tun side.

After this the head becomes uneven, it has the appearance of rock work, and is only remarked by its height; it then becomes lighter, more uniform, and of a greater depth, rounder and higher in the middle, and having a tendency still to rise, is not yet *fit to cleanse.*

When rose to its utmost height, as may be perceived by its inclination to descend, it gradually falls into a hollow in the middle, it then appears more solid, and the colours changing to a higher

or yellow or brown, the wort is prepared for *cleansing*.

After this no farther fermentation should be permitted, for as has been said, the head may in decline injure the drink.

I have been more particular on this head, as upon a thorough acquaintance with this branch of the process, most essentially depends the producing of good beers, and therefore commands a more curious and correct attention.

As to small beers, such being hastily carried on, it cannot be supposed that the like signs should be regularly attended to, but may be in some measure determined, by observing, that as in the coldest seasons the head will rise to six inches, and in what is generally the warmest weather to one inch, the medium is three and one half inches, and the fall being one half, it is then in due order for cleansing.

When beers are cleansed or put up in the casks a fresh fermentation ensues, in expectation of this, the bungs are laid gently on; and when the ferment is concluded, to be stopped loose, but the vent peg for a time left a little loose,
until

until it is obvious that no farther ferment will for the present ensue; if then the liquor stands still, and was brewed about October, nothing more is expected until the approach of summer, when the vent is to be loosened again, and its last ferment finished.

Of Cellars for Beer.

The beer being in the casks, proper cellarage becomes a necessary consideration; of this, situation dictates much, and the rest determined by art; in some towns, and in particular at Nottingham, the cellars are generally formed out of the rock, in some parts several stories deep, in such places, by means of the equality of the air, beers well brewed, with sufficient malt and hops, will be preserved in good order many years; but as such convenience is rarely to be had, the next best are dry vaults; the next such as are constructed with thick walls on the north side of a house, and the door immediately opening from within the house, as in such case, but little difference occurs from equality. The last are such as the necessity of situation prescribes, but will not answer the purpose for keeping beers, as being

D subject

subject to all the inequalities of air, and intemperatures of weather.

The difference of air in the shade, and in the power of the sun, in the hottest days, is computed at sixteen degrees, and the difference between the greatest heat and cold in the latitude of London, as 75 is to 25; but in the common course of seasons as 80 to 30, and beer cellars generally in winter hotter than the external air ten degrees, and in summer colder by five; but as from what has been previously remarked, situations are very different, and the temperature of the air consequently the same, it will necessarily follow, that experience only can fix our judgments, as to the quality of the air, in this or that kind of cellar, as it may happen to be situate or constructed; and as cellars are not possible to be alike in all places, the above hints are as ample directions as can in such case be given, in general they should be as free from the various affections of the weather as possible, and the quality of the air, as to the extremes and medium being adjusted by the thermometer, a conclusion may be formed to something near an exactness, how far
any

any cellar is to be depended upon for keeping beers, and to furnish them accordingly.

The Care to be taken to have CASKS always sweet.

What ever care may be taken that the ingredients be good, and the process of brewing conducted with skill to the cleansing, if the casks be not sweet the whole guile is utterly destroyed; as for this negligence, no apt remedy has been hitherto known, nor is there any necessity there should, as the having vessels in good order demands a most accurate attention; but this evil is not without remedy, if considered in time, before the drink is ready for cleansing.

The foulness of vessels most usually results from their not being scowred in time, after being cleared from the drink, as a thick clammy substance adheres to their sides, fill up the uneven spaces in the staves, and such matter hardning by the bungs being left open, as usual in empty casks, the power of boiling water, or such like simple menstruums, will not operate to any utility.

In the utensils for brewing that are negligently left foul, the like difficulty doth but in part occur, as they are all

so open to be come at, as with birch brooms, labor, water and wood ashes, they may at any time be sufficiently scowred ; nor are they in the like manner subject to the same stubborn adhesions, tho' the sediments necessarily left, will give trouble enough, if not timely washed away.

When casks are thus fouled, but two obvious remedies present, by the slack of time, or by taking out the heads ; lime suffered to slack in the cask, when the only aperture is the bung, may by its strong alcalious ferment and austerity dissolve the corroded sediment, and then warm water and wood ashes probably wash away the relicks left by the lime slack ; after which, and when dry, if the fœtid sour flavor is not thoroughly emitted, perhaps a few brimstone matches may operate to effect.

If these fail, and the least bad scent remains, after 24 hours being bunged up, the next recourse is to taking out the heads, scraping the inside as clean as possible, and then firing off the rest with fir deal shavings.

We see by this what trouble and expence negligence produces, for had these
these

these casks been, as soon as out of use, well cleansed with warm water, and when quite cold bunged, so as to be kept from air, and dirt, all rectification had been needless, but permitted to be filled in that bad state, in one week, not only the drink be turned sour, but attended with so rank a flavor, that even a new fermentation will not sufficiently remove to make good vinegar.

Of Brewing in general.

All malt liquors are in one sense brewed the same way; that is to say, the water goes into the copper, passes thence into the malt mash, through that into the receiver, then into the copper again, thence into the cooler, thence into the wort tun, there fermented, and thence cleansed into the cask; in this general light the process is alike, but in the mode of conduct, in the difference and quantity of the ingredients for the like proportion, in the color, flavor, fermentation, aptitude for precipitation, fining and quickening for use so very different, that we are obliged to give the drinks of various tastes and qualities, as distinct denominations, as is given to the variety of foreign

wines, which being extracted from very different juices, merit that distinction; but the distinction of beers, ales, &c. result not so much from the difference in the first principles, as from the methods of manufacturing the same ingredients, by which they become, as it were, in their varied states another kind of liquors, in so much that the word beer is in a great measure equivocal; so that a foreigner, who having tasted but one kind, and says he does, or does not like beer, in effect speaks nothing determinate.

It is for this reason that a book written on the subject of malt liquors, must necessarily delineate the various species of beers or ales, extracted generally from the like ingredients, with some trivial exceptions, but materially altering, in the manner such are manufactured; and as to the choice and application of them, as it respects precipitation, fineness, flavor, keeping, and other requisite qualities, in which is considered, the nature of the barley, the fuel with which it is dried into malt, the high, low, and different mediums in the curing, the knowledge, use, and application of the hop,

hop, and of such foreign ingredients, as are sometimes found necessary to bring liquors by art to the like apparent degree of perfection, as the same naturally arrive at, as when the skillful brewer only employs the common ingredients; and here it is previously necessary to say something more critically on hops and yeast.

On H O P S.

I have considered this vegetable before, as seemingly compounded of two distinct qualities, the austere, or coarse and harsh, and the aromatic, sweet and unctuous; but it is possible, that this distinction only results from a different degree of maturation, produced by the power of heat, from the same genial principle; and as all vegetables, and fruits, are most perfect and delicious in their highest state of maturation, in suitable climates, and hops only partially matured in this climate, it seems to follow as of necessary consequence, that if we would obtain the full flavor and perfection of this vegetable, it must not be so used, as by any means to extract the immature, or austere, so as to blend it with the mature or aromatic, least

the harshness of the one, intermixing with the softness of the other, destroy the main intent of taste and flavor in the drink; I must therefore, as in a former section, here again give it as a right method, to extract the requisite quality by a separate decoction, as from thence only can be judged when you are arrived at a proper period.

Of Y E A S T.

It is said by a very ingenious writer, thoroughly conversant in the practice of brewing, that if in the wort tun you suffer the head to sink too low before cleansing, that the coarse oils of the yeast will intermix with, and grease the drink, and consequently taint it.

It is said again by the same writer, speaking of the amber beer, that the yeast at a certain period is beat into the wort, and that notwithstanding contrary opinions, he does not apprehend any ill consequence therefrom.

This is the sense, tho' not the express words, and then it remains only to consider, what difference there can possibly be, between letting the yeast fall gradually, and forcing it into the drink, as the latter seems to me to
more

more establish an intermixture than the former.

This I am the more particular in mentioning, as most of the drinks I am now to speak of, have the yeast beat in, thence supposed made heady, and seemingly stronger than such as are otherwise treated, brewed from the like quantity of malt, and I should think, if the first principle be true, they will be greasy and ill tasted. And this perhaps is what those, who like to be intoxicated for a little money, call soft and smooth.

I shall therefore in the first place give the manner of so using the common ingredients, of water, malt, hops, and yeast, as to make a pure and perfect drink, at all seasons of the year, of several degrees of strength, and for various times of keeping, and calculated as well for the lower, as for the higher order of families; that is to say, for such as brew much, and for keeping; as for those who brew only a small quantity from two, three, or four bushels to those who use as many, or more quarters of malt.

Most large and opulent families, who use much malt, have their own regular brewers; and as they generally succeed pretty well, may not be easily induced to vary in the minutest manner from their customary method; but it must be observed, that there is an essential difference between drinks brewed tolerably well, and such as are at the same time intended to be of the vinous kind, calculated for health and pleasure, and to bring malt drinks once more into vogue, by exalting the taste, flavor, and power of dilution equal to wine, without any of the ordinary bad effects usually resulting from malts or wines.

Laying aside vulgar opinion, that foreign wines are used by the rich, rather from vanity than taste, it must be observed, that experience will always be superior to custom. Men who live luxuriously, and whose palates relish high fauces, most necessarily, amongst other disorders, be subject to scorbutic humors, which vinous drinks, and light diluters, seem calculated to repel; from whence, by a parity of reason, it should seem true, that unctuous, nutritious fluids, have a quite contrary effect,
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and such are beers much boiled, and aley. Our business then is to prepare our malt drinks, as nearly as possible to answer the like purpose as foreign wines, in which view it is, that I propose the following directions; but as either prejudice, or a different turn of thinking, may induce many to better approve the mode of their ancestors, I shall, after what I have to say on my own theory, distinctly state the methods of the most noted breweries in England, as also private practice.

The Method of Manufacturing pure Malt Wines.

I presuppose the copper placed at a proper height, and a tube so fixt, as to convey the water from thence into the false bottom of the mash tun, and the copper to contain a sufficient quantity of water to supply the mash. The malt and hops in fine condition, and all the vessels duely proportioned to the quantity customarily brewed, the rule now prescribed is for the paler kind of malts, and for making two hogsheads of drink for keeping, with a reserve for fine table beer, which, tho' best brewed alone, will by the method here proposed answer very well and save a double brewing.

I likewise presuppose the malt ground in an upper floor, over, and calculated for shooting into the mash tun.

The P R O C E S S.

Into the mash tun shoot twenty bushels of malt, while fresh, but cool from the mill for the first extract, if you must make two extracts, as one only is best.

The water is to be heated in the copper, up to 140 or 45 degrees by the thermometer, as the malt is browner or paler, or as the season of the year presents. This is intended for October, and two or three degrees difference within the said numbers, or under the lowest, not very material, especially if the malt has been long ground, because then the extract will be readier.

The water issuing into the false bottom of the mash tun, from the copper placed a proper height, will rise through holes in the bottom of the mash, in bubbles, to the surface of the malt; it is then to be moved with fine iron rakes for half an hour, and again, if not sufficiently separated, with oars or paddles some time more; and then to rest one hour and a half; or until a fine white
flake

flake settles at the bottom, and the extract comes off clear.

As this first extract is supposed for one hoghead, it is necessarily presumed, that the copper should contain one hundred and sixty gallons, to allow for imbibing, or what the malt will retain.

Then let two pounds of hops be put into a bunting bag, net, or prepared tube with a grate, or any vehicle that will retain the hop, and suffer the extract to pass freely through into the receiver.

The reason of this is to prevent the acid of the extract rising prevalent, and tainting, or, as brewers term it, foxing the drink, a taint that once attained, is hardly to be entirely remedied.

The mash tun is then to be supplied with two bushels of fresh malt, and the extract made in the same manner as before, except that the water let down from the copper may be filled up to full 145 degrees, and requires only one hour's raking or oaring, and the like time for settling.

While this second extract is settling, the first is conveyed by pump, or lading, from the receiver into the copper; and
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here appears the convenience of two coppers, as in common brewhouses, but as that is not in this case presumed, one may suffice.

As to the time requisite for boiling, depends upon circumstances, that only the brewer in practice can truly regulate; extracts from the paler malts for keeping the year round, are not necessarily boiled more than half an hour, and it is left to consider only when the drink is intended to fall fine, on which intention more or less boiling may be proper, and the above time is given as a due medium; but one rule never varies, which is, to let down the wort into the cooler as gently, and dispose it as thin as possible, so as just to cover the bottom, and to pass it cool into the tun.

The quantity of hops requisite, will essentially depend on their goodness. The quantity of malt used, and the time proposed for keeping; the time here proposed, is the circle of the year, the quantity of malt 22 bushels; and as the quantity of hops, in practice, is six pounds and a half to eight bushels for a year's keeping, seventeen pounds fourteen

teen ounces may be sufficient for twenty-two bushels; two of these have been employed in the extract, and to continue the third extract for table beer, so that only fifteen pounds fourteen ounces remain, from which an extract is to be made by decoction, the reason of which has been previously noted.

For this extract no regular prescript can be given, as the proper height must entirely depend on the taste, and arrive at perfection sooner, or later, as quickened or retarded in the decoction; I can only observe, that a medium degree of heat, as equally preserved as possible, will produce the finest extract, and even gradually dissolve the coarser oils; to avoid which, when the least austere or harsh taste rises, you have gained as much extract as you ought to have, the quantum may be in any division disposed to the two malt extracts, a few minutes before they are severally let down into the cooler back, and will answer a much better purpose, as to complexion, flavour, and keeping the drink, than if boiled gross in the wort.

It is a known truth, that no active spirit can be produced from malt, except

cept it be first fermented, and the means of fermentation is equally known to be by yeast, so that only remains to be rightly apprised of the quantity and quality. The curious always select their yeast, when it is to be had from the best keeping strong beers, because of its greater spissitude, slower in its operation, more to be depended on, and producing a more cool and regular fermentation, as that from smaller drinks, acting too sudden, puffs up the wort to a kind of fret, or effervescence, and for that plain reason, to be as much as possible avoided.

As to the quantity; this materially results from the state of the air when it is to be used. The medium of air in Middlesex in October, is at about 45 degrees; and the proportion of yeast to one quarter of malt, in that state of the air five pints, to a quarter of malt, or something more, by which calculation any other proportion is readily known.

Fermentation in its process has various appearances; its first is a white circle round the sides of the tun, next in an even thin crust, then in a rough form, then more smooth and higher in
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the middle, and then begins to sink. When declined about half way down, is what the brewers call *fit for cleansing*, or, as they speak in the country, *tunning off*. The fermentation then being determined, the drink must be casked.

As on casking the fermentation is impeded, the following process ensues. I should have observed before, that one fifth part of the yeast pre-assigned should be reserved, and now on cleansing thrown into the wort, and that well stirred for an hour before, put into the casks, hence a fresh fermentation arises in the casks, and when that is over, the operation is totally finished.

The spring following, it will probably ferment again for the last time, so that on the approach of March, the vent peg should be loosened, and when the ferment rises, if the cask lie on the bulge, the bung loosened, and so the head bung, if they stand perpendicular; perhaps a vent peg in the center of the bung may be sufficient.

This drink, accident omitted, will fall somewhat fine at Midsummer, or perhaps sooner, as incidents occur, without using art; but will not be fine enough

enough for bottling perhaps until September following.

To avoid breaking into the process, the table beer, or what was intended for it, was left in the mash tun, and two bushels of malt from the three quarters reserved to be thrown in, as also one pound fourteen ounces of hops, the main course of the process is to be pursued as before for the strong beer, but from this, one hogshead is to be extracted. There is only to be observed in this last extract, that if it is intended for summer drink, and to fall fine in due time, four pounds of hops is sufficient; and if for more early use, or what is called present spending, the reserved quantity is very sufficient; and on these principles, to be only boiled half an hour, or fifteen minutes, at discretion; in the last case it will come round, and may be drawn from the cask, or bottled in six weeks; the yeast to be used in fermenting the wort, if from strong beer, need be little above the proportion of one third the quantity of what was applied to the preceding extracts, but that as it is found to operate.

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I have only left to observe on this head, that after the hops in the net, or other machine, the extracts passed through, and those left in the decoction, are done with, they may be dried again, and burnt, the ashes being replete of fine salts, will be an excellent manure, for a bed of light earth, whereon the most curious seedling flowers are to be raised.

Of LONDON AMBER and BURTON ALES, as managed by the common Brewers.

Practice will always have the advantage, when at the same time theory, or the principles of an art, are thoroughly understood, without which, the best practice in these kind of compositions, are apt to deceive, without the practiser being able to account for, or amend his error; when a mistake happens, and therefore a previous theory requisite, this will appear more evident, as we proceed in distinguishing the various kinds of malt drinks; but here the gentleman is to take care to distinguish himself from the brewer, as the latter forms his mode of management from a view of profit, does many things a private family must not do, to make his drink stronger or
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more heady, than the quantity of the ingredients, or natural quality of the extracts, will regularly bear; while the former is only concerned, to have his drink as strong and fine, as the most common ingredients and plain management may effect, unless he brews for election beer, or such like wise purposes and then may use the brewers art in what manner he pleases, but will hardly be induced to injure himself and family for the vanity of saying he has stronger drink with one, than his neighbour with two quarters of malt.

This I presume may be a sufficient hint, to avoid being prejudiced to that part of practice, where health and pleasure are prostituted to licentious profit, and only to select from practice, what may conduce to the establishing the art of brewing on the basis of rectitude.

AMBER is the medium degree of color, between the high brown and clear pale malts, and consequently dried to the like proportional height, and at that height of driness will require two barrels of water to wet one quarter of malt in the first mash, as near half that quantity will be retained after the extract;

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ut as the grain will be nearly full, the second extract needs little more than half the quantity of water, unless, as in the former chapter, it is supplied with fresh malt, and then in a common proportion.

The process is thus pursued. The water is heated for the first mash to an ebullition, and reduced again, by *cooling*, as the brewers term it, i. e. using as much cold water, as will bring the whole to an even temperature, and then setting it down into the mash tun, it is then raked and oared one hour and a half, and after the same time settling, is let gradually off into the receiver, and thence pumped into a second copper; this is pursued in the same order by a second, third or fourth extract, if small beer is not to follow, and then usually boiled a full hour; in this course the stop, both as to quantity, quality, and application, is quite arbitrary, or dependent on the time the drink is to be kept; some suspend part of the quantity in the first water for the extract, and boil the residue in the wort, and some run the extract through part, and then boil the remainder; and is usually calcu-

calculated at one pound of hop to one quarter of malt for one month's keeping, and so in proportion for any given time; but in summer requires double the quantity, and more, the medium is about three pounds for two months keeping.

The working is the same as in the preceding chapter, except that the yeast is periodically beat in, as the brewers say, to attenuate the combined particles, and make the drink fall spontaneously fine; and if this be true, and all the effect, it is very happy for those who drink it.

Besides this, to the like purpose, after cleansing, and to bring it early about, the brewer uses an artificial fermentation from time to time in the cask; this rouses the active spirit, breaks and disperses the unctious quality, and the basis that feeds it being so disturbed, it quickly comes round.

The brewers that are critically correct in the management of the fermentation, propose the thermometer for their guide, to be truly informed at what degree of heat the wort ought to be, when the yeast is applied; and as

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by their calculate, the extremes are 25, and 55, the medium heat of the air is 40 degrees, and this the best season; in such case the heat of the wort should be at 52 degrees by the like measure.

The reason of this exactness seems to be, that if the wort be too cold, a longer time is required to make them ferment, and then with more difficulty become fine; on the contrary, if too hot, a waste of their spirituous parts ensue; and if not kept a time to remedy the defect, may be foxed.

As to the quantity of yeast to be used, supposing the air at the above medium of 40 degrees, and no small beer to be made, the sum will be eight pints to a quarter of malt, at the highest degree of heat six pints, and at the lowest nine pints; but this, as said before, depends on the strength of the yeast, and to be computed accordingly, and always a fourth or fifth part reserved for the casks after cleansing. Note, the quantity of yeast required is most to beer long boiled.

BURTON ALE is the like kind of liquor as amber, and the process much the same, but there is a material difference

rence in the lengths, or quantity extracted from the like proportion of malt, as also in the quantity of hop, as this is intended for longer keeping; as the length of the amber is from $1\frac{1}{2}$ to 2 barrels, and the Burton from one, to $1\frac{1}{4}$ from a quarter, or eight bushels of malt. The quantity of hop is from one pound to seven, and the medium for six months keeping four pounds.

This is as much as is necessary to say on the process of Amber and Burton Ales, they are both soft heady drinks, in no respect calculated for private families, nor for drinking as diluters any where; but if the latter of these was brewed in London, as the duty is on the barrel, and the retale price much higher in proportion, the profit must be considerably greater, than in brewings of a more extended length, both in respect of the duty, and expence of the manufacture, which is too obvious to need farther explanation; and considering the high price of malt and hops, and extravagance of the duty, I can perceive but one reason why any wholesome diluters are brewed at all for sale; and that is, for the great brewers to break
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the little ones, and then take the chance of better times; and if the same scheme rules above, I can only say, that it is to be lamented, not only as to this, but various other manufactures.

TABLE BEER, *an entire Brewing.*

It has been seen in every process, that water is the first article, and so it must continue, but how it is to be managed, I, and the practised brewers, are not so well agreed about; their mode is, as before hinted, to first raise an ebullition by heat, and then, as they term it, *cool it in*; that is, to bring it to a due temperature, by a certain proportion of cold water; my process is, to bring the water at once to the like temperature, before ebullition, or if you please to save double trouble, and for some other reasons.

It is to be noted here, that when a certain judgment is to be made of a due temperature, we are equally guided by the thermometer. But the brewers hypothesis is, that water in the copper is colder at the bottom, than at the top; and consequently, not of equal temperature in every part. This may be true, as no doubt but the heated particles by

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an increased levity fly up ; but they say again, what is equally true, that as the heated particles fly off in ebullition from the surface, the moved water rolls downwards, the next heated parts replace the falling, and so a kind of circulation ensues, and consequently is nothing hotter at top than at bottom, except just within the sphere of ebullition ; but suppose it otherwise, the cooling in can be no more presumed to make the water of an equal temperature, than its being left at the same degree of heat, without rising to an ebullition ; for as it is in a quiet state, or not much disturbed as when boiling, and is neither let down immediately from the top or bottom, it seems in the passage through the cock to be so intimately mixt, or the variation so trivial, as that half a degree of heat, the most possible difference, can never make it essentially necessary to pursue the brewers double process ; more especially, as experience evinces, that in the variety of powers, and heats, occurring in the ingredients for the extract, the sum of half a degree of heat, or more, is not to be ascertained by the most practised judgment ; but it is a known

known truth, that if the water be not too hot, or not above 145 degrees, it being five or six degrees lower, will answer very well to any species of malt usually employed, nor needs it that curiosity is carried to such refinements, as to make the brewing of fine drink, so difficult and abstruse an art. Besides, if the old way of trying the heat of water for the extract was found as to this particular very well, the experiment, as has been before hinted, is very easy, to find sufficiently near, what the proper heat ought to be, by the thermometer at that medium; but as that way will not suit the present practice of the water rising up to the malt, by a false bottom, instead of the malt being put to the water, what I have mentioned is only material, as to the experiment what degree of heat the water ought to have, by knowing what it is, when, according to the old measure, you can see your face in the surface, as may be done in any vessel, merely to regulate the judgment by, if any doubt arises concerning the sum previously given. And this I am the more particular in, as I do not find that the best practised brewers

are able to determine this point to any degree of certainty; nor possibly can, unless the quality of the ingredients be first well assured.

The P R O C E S S.

The first act of this process having been thoroughly canvassed and considered, the next respects the malt proper for a fine vinous diluter, adapted to health and pleasure.

Experience has shewn, that malt liquors either new, strong, or aley, are not calculated for digestion, whatever other purpose they may answer. The lengths usually run for common small beer, are five barrels from one quarter of malt; but as this is too much for the present intention, as rather too weak, it is presumed, that a length of four barrels may be a proper medium, being nearly the same, as the best Dorchester small, and answers every desired purpose, at a much cheaper rate,

The malt that produces the cleanest drink, and that soonest settles spontaneous fine, is that which is most gradually kilned, and with the sweetest firing, as the curing, whence any smok results, alters the taste and very nature

of the drink past remedy. This is the finest pale from the coake kiln, and extracts with less violence of heat, produces the same real spirit in the ferment, but is not so strong, or gross flavored on the palate, as what is in proportion higher dried.

The seasons for brewing are October and March; tho' by various accurate observations it appears, that the air is several degrees hotter in October, than in March, the former succeeding the warmer, the latter the colder seasons; on the other part, the warmth increases on the latter, and decreases on the former; and tho' the former is manufactured at a higher degree of heat in the air, the latter comes on sooner. These particulars make the apparent difference in some measure consentaneous, and experience has given to these seasons a general approval.

This drink is not to be run off at more than two gradual extracts, in the proportion above-mentioned, of four barrels to a quarter of malt; and as intended for six months before tapping, or something more, so as the two brewings come properly round in due order, the

mashing, hopping, and working, is much the same as in the last chapter, except as the acid will not be so prevalent, more yeast may be requisite to a due fermentation, unless some vinous acids be thrown into the wort, not at present in practice.

It is a matter of dispute among the informed in this art, whether high or low, tender or violent mashing be best; but this argument, being rather between the brewer and the gentleman, profit and utility, than the nature and reason of things, it may not be improper here to consider, that body is in some degree to be attained, as well as spirit, tho' not in the same degree for private use, as for sale, and if over forced, makes the drink heavy and flatulent. The brewer usually exceeds the proper medium of body; and for this special case of *Table Beer*, it would be very improper to mash up to that medium, whether we consider it in the appearance of salutary or bright; it is plain then, what the operation of mashing ought to be. The merely separating the malt, its parts, in such a manner, as that every grain alike malted, may suffer an equal

equal extract, for as, if not well separated, it will clot, or set, so if too violently forced, it will, like all other vegetables, emit a very disagreeable, and perhaps not very wholesome, substance, that will utterly destroy the intention of an antiscorbutic diluter; the action of mashing with propriety will then depend on the eye and judgment of the agent; as because of various incidents, not theory, nor practice, can absolutely dictate, and may only, as in general, be said, that if moderately raking, will not produce a due separation, apparent enough to any attentive eye; a farther process must necessarily ensue, until such separation be effected, which usually happens, if room enough in the tun, in half an hour or less, and then requires not any farther mashing, but one hour afterwards will not be too much for the extract and settling, in a degree of heat as equal as possible; an hour may be sufficient, as a second extract is to be made in the like manner. In the process for strong beer, the extract passed into the receiver through two pounds of hops reserved from the decoction; in beer of the moderate quality here pro-

posed, one pound is sufficient, as this is not in the like manner apt to run roapy, fox or taint, the fluid being lighter and thinner, and be considered as a general rule, whereby proportionally to be governed, according to the greater or lesser quantity of malt used, and the lengths or quantity of drink to be extracted, and will hold as a maxim universally true, more especially if the whole be of only one extract.

There is some dispute; tho' I know not on what good grounds, whether in fermenting the wort, it is necessary to be worked in the tun at all, or only after cleansing in the casks? it is certain, that fermentation attenuates, and the purpose of attenuation is to separate the gross parts, and make the drink equally in all parts fine; the moderator in this is the hop, as without it, no sooner the oils of the wort are so attenuate, as that the acid may predominate, but the wort becomes sharp and pungent, from the operation of the air, as from the malt; therefore if the objection to the working in the tun before cleansing be only the air's impress, it seems of little avail. The truth is, that the fermentation

mentation is to be as gradually and evenly continued as possible, until, by raising a small quantity through the center of the wort, from the bottom of the tun, it appears bright, it is then in a state for cleansing; but as in cleansing a flatulent disorder will ensue, it is necessary that a light fermentation be, in the cask, again encouraged.

I have only one observation more to make, which is, as this *Table beer* that is proposed as a substitute for wine strictly so called, or as other light diluting liquors of the vinous kind, the curious herein, should make their wort from one extract only, if convenient, as it will be sufficient to bring away the more lively and spirituous power of the malt, and the drink sooner become spontaneously fine and transparent, the body, with a little longer continuance in the mash be sufficient, and at the same time to take due care, that the wort be supplied only with the most pleasant extract of the hop, by decoction, as previously directed.

There will no doubt remain after this some strength in the mash, and those who are not curious may esteem

this waste ; but I am writing for health and pleasure, and as but few will brew for the proposed purpose, but what can either afford waste, or that have not more ways than one for the disposition of the residuum, I have only to remark, that as four barrels of fine beer from one quarter of malt will not, on an average, including all expence to a private family, cost above forty shillings, or three pence halfpenny the gallon, it matters little what becomes of the waste.

O A T A L E.

This drink, I presume, by the simple manner of obtaining it, was probably the same as our ancestors, the Britons, prepared for their festivals, and of which *Cæsar* speaks in his Commentaries with much respect, and of the like kind, as the Indians in some parts of America extract from their maiz ; and as being of a lighter quality than the preceding, is here, in its proper station, at the election of such as may be pleased with the finer kind of malt liquors.

The oat is certainly the weaker species of grain, that is used in these sorts of extracts ; and the best oat for the purpose

purpose is the *white short small*, as being the plumpest, as having the thinnest skin, and as yielding the most flour.

The malt is to be prepared in the like slack manner, as the palest barley, and may after grinding receive the air for two or three days with some benefit, as it will open with more facility to the following extract.

One quarter of malt is here proposed to make an extract, or length, of two barrels, and consequently must be supplied with one hundred gallons of water, to allow for what the malt may imbibe; the water, according to a prescribed mode is to be cold, as intended only to extract the more spirituous, and to leave the coarse oily quality behind; for which reason it is necessary that it be 24 hours in steeping,

The water is to be given in to a false bottom, as in previous brewings directed, but raked only at various periods, so as to preserve a due separation, leaving it at least four hours to settle, as then the extract will be as perfectly made as this process intends.

It may be now perceived, that the heat of the air in the proper season for

this drink, between March and September, and the natural heat of the malt, will give a moderate warmth to the extract, sufficient to draw off the finer oils, in some measure balance the saline, and fit it for fermentation without boiling.

For which purpose, and to give the extract its full power, the natural heats are to be as much as possible preserved by well closing the mash tun; and this with much the best effect if the entire extract be made at once, as the decoction will be more regular, the heats better preserved, and no mawkish grainy taste ensue.

When perfectly settled, it may be run off, either through, or without a decoction of two pound of superfine hops, because there is no fear of the wort, in this mode of operation, becoming roapy, tainted, or foxed, as when the grosser parts are extracted by superior violence, or as when the nature of the malts are more gross, and the use of the hop will rather be to correct its future fermentation; but when the hop is in the wort, it will not ferment, without the aid of, herhaps, a
pint

pint or more good yeast. And as attenuation will not in this case become much wanted, a very slight ferment in the wort tun, and still slighter in the cask, will answer every requisite purpose.

This drink will precipitate in about a fortnight without fining, and may, according to the heat or coolness of the season and temperature of the cellar, be drawn off from the tap, or bottled at pleasure.

No fixt rule can be given for this, but as it may be as soon as thoroughly fine, the experiment is so very easy and natural, as it would be an affront to common sense to dictate a determinate measure, when none but those who have it can possibly judge when it is come round.

A GENERAL ESSAY.

The lightness of the above subject, naturally leads me to consider malt liquors more generally, in the different parts of England, under the management of common brewers, or private families.

Wiltshire is the most remarkable for the use of the lower or slack dried malts, and the inhabitants more generally accustomed

customed to the brewing of bright beers, and this again more in the dispersed parts in the country than in the great towns, not even Marlborough excepted, where indeed approved drink is brewed for sale, but not of so happy a kind as in the villages about Salisbury Plain, where every little alehouse can furnish a traveller with a better beverage than Marlborough, or any other town I have passed. There must be some reason for this; and as what has been said before may give the hint, is by the practice here confirmed, as the people are more generally fresh and healthy, than in most other parts.

It is said by some, that if the water be clear, it is not much to the purpose from what springs derived; I must confess, there appears to me a sensible distinction, especially as it respects chronic disorders, from which those who are in the vicinage of chalk springs of the saponaceous kinds are most free, and when with such kind of soft waters, the fine sort of malt and hops, and a peculiar management in brewing are combined, the effect must be excellent, and so it proves.

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The advantage of cellars, in some other places, may in some measure seem to balance the account, but here is not the same necessity, the beverage I am speaking of needs them not, as undesign'd for long keeping, nor in my opinion any long kept beers answer the end I have in view, as their lengths must be short, their boilings high, the body of the malt too much forced, and too grossly hopped to answer any good purpose, as from hence a variety of disorders ensue, that I cannot with pleasure enumerate.

All these light Wiltshire Beers are manufactured after the like mode of management, as in my section of table beers, and with the like species of malt and hops, except as to the decoction of the latter; but to balance that, great care is taken, not to extract to any degree of violence, nor indeed is there any necessity, as two pound of hops is sufficient to a quarter of malt in the summer, and half that quantity in the winter for six weeks keeping, and so long as this drink is found healthy and pleasant, the brewings come quick round, as the customers drink plentifully, and find no insalutary effect; hence
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I would draw a very fair conclusion, that admitting the premises true, the beer brewed from the same ingredients in the like manner, will be equally pleasant and healthy.

These drinks have all a little turn of the acid, much like the *Pruniacs*, or *Maravela* white wines, and answer in the same manner the purpose of dilution, without any sudden intoxicating qualities, may be drank freely when the blood is warm, and a little lowered in quality, prove excellent table beers.

Marlbrough Beers are brewed higher, and of a more potent quality, as being intended for the London and foreign markets, but are not boiled to the same degree as either London Porter, Amber, Burton, or any of the northern drinks; the malt is finer, the hop more carefully considered, and to give it an equal power with beers of the like value at market, and avoid the effects of evaporation by over boiling, bean or wheat flour, or both, are sometimes used, proportionate to the quantity brewed.

This does no harm to the quality, while it increases the strength, but gives it a particular tang on the palate that some people do not dislike, but this may

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be owing in part, either to beating in the yeast, or letting down the sediment, either of which contribute to destroy the vinous product of meer malt and hop, and gives it a particularity, that is but indifferently relished by those unaccustomed to its flavor.

The lengths of this beer is much the same as of most that are brewed for sale in the country, but not quite so soft and mummy as the Burton.

The malt for the extract is usually the amber, or somewhat paler, as either separate or mixt, as best conceived by the different brewers, tho' all passes under the like denomination.

The great brewers have a singular advantage in making their own malt, as they can manufacture it to their liking, both as to leifure and color, and thereby suit it to the proposed market.

It is calculated for a twelvemonth's keeping, but as it naturally precipitates often long before that time, it is for some markets racked, and for some bottled much earlier; it is a good beer, where none more curiously brewed is to be had, and would the manufacturers abate something of their ancient customs,
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might be as excellent for keeping, as the generality of Wiltshire drinks are for present spending.

Dorchester Beers seem to be designed on nearly a similar principle as the Marlborough, except that either by letting down too much of the sediment from the cooler back into the wort, or to some practice in the working, the former has a much more sickly flavor, sufficiently evident both in the smell and taste, but is much better preserved, in being the same throughout than the Marlborough, as that seldom furnishes two bottles alike in a dozen; what the reason of this difference may be, whether in the working, cleansing or bottling merits not much enquiry; but it seems to me true, that a bad flavor in the ordinary course is much easier preserved, than that which is good, and perhaps at last, its feeding, as they term it, whether by sediment, by bodies of a more potent nature, or by suffering it to be yeast bitten, by the too great precipitation, or beating in to the wort, may in some measure contribute.

“ It is said to be brewed from barlies well germinated, but not dried to the deno-

denomination of malt; and that its peculiar taste proceeds from the slackness of the malt, and the quantities of salt and wheat flour, mixed with the wort when under fermentation, which gives it a mantling and frothy quality."

I am apprehensive there must be something more than this, as I know not any malt liquors, low boiled and slack hopped, that when early bottled, has not the like mantling and frothy quality, as it is a kind of effervescence or fret, occasioned by a defect in the counterpoise of the malt and hop, as a due proportion of the latter gives wing to the imprisoned air, and corrects the acid, boiling high has in some measure the like effect; this is obvious in the London Porter, that when well brewed, and of a due age, rarely mantles in the bottle, and the same in all strong beers, that are boiled and hopped high; but from whatever cause it springs, as many may be assigned, where other ingredients are used, as will appear in due place, it is certain, that neither its smell, taste, flavor, mantling, or froth, will ever recommend it, to a judicious palate, or
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to answer any pleasing or salutary purpose.

As to taste, all beers will be sensibly different, tho' brewed in the same manner, and from the like ingredients, because of various incidents occurring in the operation; so that the perfection of brewing, if that may be attained, is, as in cookery, to have no one taste predominant; for however that may distinguish different drinks, it can only be agreeable by habit. The expert in the brewing art, like the wine coopers, have found means to make marketable drinks have always something a like taste, by adding, when wanted, more of such ingredients as give it a predominance; so that any one may say, this is Dorchester, that London beer, and indeed they are sufficiently distinct both in taste and quality; but if either stand a proper age, this distinction is cured, in despite of art, and at length reduced to that natural simplicity, as is common to the Wiltshire beers previously mentioned, in their prime state for drinking, being sufficiently old, when keeping beers are immature and disagreeable; so that however the controversy may be
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in respect to different tastes, time melliorates the like ingredients into one common medium, and prevalence only abounds, when something uncommon, either by accident, or art, creates a sensible distinction.

A learned writer in the Philosophic Analysis, has given us a long tract on taste, its simple and compound nature, the different species and combinations, very ingenious, but not calculated to our present purpose.

One other writer has delivered himself briefly, and more to the point in view, deducing the distinctions of taste in the following manner. The *acid*, a simple taste.—The *sweet*, an acid, smoothed with oils.—*Aromatic*, a spirituous acid, and volatile sulphur.—*Bitter*, an oil impregnated, with alkaline, or acid salts, shakled with earth; the *austere*, an astringent bitter, and lastly, the nauseous and rank.

The *Austere* affects all drinks, wherein the hop has been too violently forced, and the nauseous or rank, such as have been treated in the same manner, and have out lived their spirituous powers. A medium age in some measure rectifies

rectifies the former, and old time reduces the latter to a kind of empyreumatic dreg, common to ill drawn distilled liquors.

I have previously remarked in my observation on hops, that the acid is an immature spirit, and here must remark again, that the gradual distinctions abovementioned vary their tastes, and blend into a kind of neutral, as the genial warmth of the sun create in them a new birth and activity; hence springs that equal and agreeable relish, neither acid, sweet, nor bitter, that we find in all fruits arrived at a state of perfection, which in cold climates, it is difficult to attain, and which hot climates too highly elevate. This is obvious to the most ordinary apprehension, as it will ever be found, that such fruits, as have a harsh sour at their plenitude of ripeness, have the austere in conclusion strong upon the palate; those that ripen on a medium, have a pleasing undistinguished sensation, with but a light tincture of the austere; and such as ripen high, are totally sweet.

It is in a great measure the same in vegetables, and flowers, as in fruits,
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but with more earthy parts, therefore more austere; under which of these heads barley and hops may be ranked; is not so very material, as it is to evince the necessity of so using them, in malting, decocting, and otherwise manufacturing, as to bring the liquor they produce to an even state on the palate. Of this two kinds are apparent, the Burton and Wiltshire beers; the former has an even softness, the latter an even smartness; the former brewed high, and calculated to lull; the latter low, and to awake the senses. The one, like the fabled waters of *Lethe*, to make men forget themselves; the other, like the springs of *Helicon*, to give them spirits and memory.

As to the *Marlborough* and *Dorchester*, of which so much has been said before, I have only to observe, that the distinctions given them by art, is, as to the main purpose, as with the snuff-makers in London, merely considered to peculiarize a denomination; but as to a salutary or insalutary, are neither materially good or bad, nor do either merit imitation in a private family.

NOTTING-

NOTTINGHAM BEERS for keeping, are usually brewed from amber, dried in to 132 or 138 degrees. The custom has been to close the extract in the copper, and in the mash, by a cover of waste malt, bran, &c. to keep in the spirit, as such brewers conceive, and a judgment made of the degree of heat in the extract, by a previous ebullition in the copper, and a survey of their own faces in the mash tun. The lengths are according to the powers or violence used in mashing, or the various extracts made, discharged of any sequent utility, but not boiled so high as the Burton Ales; nor have they the same soft opimatic quality; but being much higher hopped, are supposed to be much better calculated for keeping; the wort has its proper state of working; the yeast is beat in before cleansing, and the drink in the cask fed with bean or wheat flour, or with materials of later invention; the convenience of cellarage gives it many advantages, if well improved; is in general a much cleaner liquor than Burton, or Dorchester, but does not circulate in London or foreign markets to the amount of either; nor is it so much the dependent

dent business of the town, as being, I suppose, better employed in the hosiery, and other manufactures.

BRISTOL BEERS, I mean only such as are calculated for foreign markets, none else being uniform, or of the like kind, and chiefly consists in a degree of strength, similar to good table beer, at the lengths, when brewed distinctly, of about four barrels to the quarter of malt; it is a brown beer, from a malt of about 140 degrees of driness. The manufacture is after the common mode of operation, except as to hopping, as intended to come forward sooner, or later, as occurrences present, and as calculated for the respective markets, principally the Mediterranean, and West India Islands.

There are beers brewed of a higher quality for the same places, but not in like proportion, as not being equally eligible in warm climates, where a kind of smartness is more required than strength.

In this manufacture are two plain points in view, profit and quick return; to this end the expence of hop and high boiling are as much as possible avoided,

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and drawing it off into bottles as soon as fine, prevents the acid gaining a too early predominance; and on the other side, by a moderate hopping, the bitter is soon meliorated, and the liquor reduced to an equal taste.

In the West Indies, it often acts the Physician on English constitutions; as that climate, and manner of living, subjects them to a costive habit, which this beer is apt to remove, and has been the saving of many, in that dangerous distemper the dry gripes, by purging of the acrid humors; it has not quite so potent an effect, on the like habits in the Mediterranean, but it keeps the body open, and is found at once grateful and homogeneous.

I am the more particular in this, as London Porter has not the same effect, tho' both from the same, or like ingredients, that is to say, malt and hops; but Porter malt is of another kind from the kiln, the quality of the drink is higher, and the superiority in boiling and hopping, makes it rather incline to a costive; than laxative quality, tho' much brewed for the same markets.

It is plain hence, that the *Wiltshire*,
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the *Bristol*, and the *London* beers, are calculated to distinct purposes, the first as a fine diluter, and to allay thirst; the second to open the body; and the last for a keeping drink; the first more vinous, the second more fermentable, and the last more permanent and staple.

Thus we see, in the ordinary way, what different species of liquors may be produced from malt and hops, by various application and management; this in part depends on that branch of the manufacture, termed boiling. It has been in some measure treated of already, and is here proposed to be so much farther discussed, as that private families may thoroughly understand, whether it be most eligible to boil high, low, or to any medium time required, or not at all.

One writer has given us a tedious verbose essay to prove, that malt liquors should not be boiled, either malt extract or hop. "His assertions are, that the boiling of wort, not only evaporates, but destroys the fine thin subtle spirits, and as it were fixes and stagnates the whole; whence a grosser taste ensues, which by habit is esteemed; but by the slowness

of its operation is longer on the stomach, and emits gross fumes to the head; and instances the distinction of taste between boiled and unboiled wort, with or without hops, as the former will be found to have lost its pleasing sweet relish, and also its opening and penetrating virtues, by which its nature and operation is altered, which fermentation does in some degree recover, but cannot regain its fine soft virtues. The unboiled, tho' it drinks smaller in the mouth, most naturally warms the stomach, and passes the body quicker by urine, which are sufficient testimonies of its superior merit."

This theory seems not to prove any thing, and may or not be right, as mere assertion dictates. Mr. *Combrune*, a practicer in the London brewery, seems to be of a different opinion, and I wish that both arguments may let us into some just a light, as to be the criterion of correct practice.

The last writer admits, it has been a question, whether boiling be necessary to a wort? but observes, that hops are of so resinous a quality, that as the whole of their virtues is not yielded by

extrac-

extraction, decoction or boiling, is as needful as the plant itself; and with fermentation productive of that uniformity of taste in the compound, which constitutes good beer; and reasons thus.

Worts are composed of oils, salt, water, and some small portion of earth, from both the malt and hops. Oils are capable of receiving a degree of heat much superior to salts; and these again surpass, in this respect, the power of water, before a wort can be supposed to have received the whole of the first it can admit, such a degree of heat must arise, as will be in proportion to the quantity of oils, the salts and the water. When this happens, the worts may be said to be intimately mixt, and to have but one taste; the fire made fiercer would not increase the heat, or more exactly blend together the constituent parts; this purpose once obtained, the boiling of the wort is compleated. And farther remarks.

That the water is first saturated, the salts next, and lastly the oils, and a violent agitation ensues; but when the parts are united, the vehemence of the ebullition fails; the noise ceases, the

worts, boil smoother, the steam, than before clouded the copper, rises more upright, and when the fire drives any part of the drink from the body of the wort, it ascends perpendicularly; such are the signs by which we may be satisfied, that the extracts are become nearly of one taste; if at this time it is turned out of the copper, it appears pellucid, and forms no considerable sediment. To this rule is annexed the following table.



That the water is...
 At next, and lastly...
 the agitation...
 parts are united, the...
 ebullition falls; the...
 words

It may perhaps be objected, by long boiling of the last worts, the rough and austere part of the hops may be extracted, and give a disagreeable taste to the liquor; but this only happens, either in beers long to be kept, or in such as are to be brewed in very hot weather. In the first case, the roughness wears off by age, and grows into strength; and in the last, it is a check to the proneness musts have in such seasons to ferment.

N. B. When there are but two worts, in brown strong, steeping strong, keeping pale small, or common small, the boiling is to be observed, as marked for the second or third worts.

Thus far I have traced the argument under the dictature of two quotations from different opinions, but must observe, that one reasons on health only, the other on practice; and it remains to consider, whether fermentation alone would answer the end of a double process, for keeping beer, as for present spending? whether it would so blend the oils, salts and water, as to bring them to an even taste? and whether, in reality, an even taste ensues, on this practice

practice of boiling, when the hop is so included in the process.

What effect fermentation alone would have on the hop, I must own myself a stranger to; but on the other side, am very well assured, that London beer in the wort so boiled has not an even taste; nor could I ever find, that even time produced that effect, either in porter, or amber; when new, they have generally an austere bitter, especially porter; and when old, a harsh unpleasant staleness. It is invariably true, that all keeping beers must have the bitter ascendant, or it could not be preserved; and when that bitter wears off, and the acid is on the point of rising predominant, then the drink, if ever, attains an equal taste; so that as to keeping beer, for which only the above rules and tables seem calculated, to me it appears impossible, that the salts, oils and water, should be so intimately blended by boiling, as to produce an even taste; but on the contrary, a certain time of boiling may answer for present spending, and then only considered by the proportion and quality of both malt and hop, for which to make rules, or affix tables, would

be, perhaps, more curious then pertinent, or to be depended upon, and so the table intimates, otherwise, the one and other, would have required the like time of boiling, and is what I presume the ingenious writer intended when he formed the table.

There are not in the whole system of brewery, any who understand the art, in all its incidents and variegations, so well as the London brewers, at least so far as profit extends; for I know not any other, that can draw two barrells and one half of potent liquor from one quarter of malt, without the minutest tincture of the grains, unless they use something more than malt and hops; what they do use besides, is not in one respect very material, as long experience evinces, that the drink is neither intoxicating, nor unwholesome, and when happily manufactured, and the hop by time duely meliorated, I am not acquainted with a more agreeable beverage of the like body; so that their practice would not be amiss in private families, if such drink could be expended as quick as in publick houses with a brisk trade, that draw a butt a day; but here we must stop,
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for as this becomes presently flat, unless bottled in time, or expended quick, it may be reasonably concluded, that over boiling has too much dissipated the genial spirit, and left only the coarser oils to support it for a limited time, and that determined, as none of the fine spirits remain, it necessarily becomes irrecoverably flat and vapid; to amend this, they blend it with new beer, which brings that soon round, but is neither in taste, nor quality, any thing like the beer, of the like denomination, of one entire guile, and keeping.

At last to thoroughly understand, whether boiling high, or low, or not at all, be best; as much depends on the question, it is requisite to enquire critically, what the power of fermentation is capable of effecting; as to me it seems obvious, that if it will answer the proposed end, the saving of double trouble and expence, which is no mean consideration; that it may well enough in some particular cases, is out of doubt, but as particular cases are but little to the purpose, as to the general end, I have traced out the sequent theory.



The Theory of Fermentation, as it respects the Question, whether boiling of WORTS be essentially necessary?

The same ingenious person, who has given us the above rules and table, has also given a Treatise on fermentation, by which he almost proves boiling the wort unnecessary; as the same general effects seem to be produced by the former, as by the latter. But whether the former would have been so produced, without the previous operation of the latter, remains indeterminate. As it seems, that the fermentable quality of the wort is dissipated by boiling, and only recovered again artificially by yeast, it would prove, that an intimate commixture, or blent, of all the different parts, is not conclusively effected by the operation of boiling, and consequently that some farther process is requisite, and that is fermentation, but it is difficult at the same time to apprehend, why that elastic air, or spirituous acid that is the means of fermentation, should be first evaporated, and then again attracted as necessary to completion.

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The argument of the same person, that dried grapes will make wine when fermented with water, in no sense proves the wisdom, or necessity of first evaporating the juice of the grape, and then using water as a substitute, to extract a vinous fluid; suppose it as well so done, which in fact is but partially true, nor do the natives of Spain ever use such a substitute, however necessary it may appear, where fresh fruits are not, for the like purpose, to be had.

In the next place, it is extremely material to consider, whether one fermentation is sufficient to the end proposed? And whether, if the fermentable quality is not thrown off by boiling, a regular and proper ferment of the wort will ensue, without the use of, or with very little aid of yeast, in the same manner as vinous fluids usually act; were these particulars ascertained, the doubt, whether boiling be necessary would be readily determined, as the same writer who directs boiling is pleased to say, that,

“ Fermentation is, where the communication of the external and internal air of a must is open, and in a perfect state, when the power of repelling is equal to that

that of attracting the air." Quere how this can be, when the internal air is previously evaporated?

- If any dependance may be had on the other writer pre-mentioned; he pretends, that beer simply fermented in the tun will keep a twelvemonth; which may perhaps be true, but not much to the purpose of this enquiry; but to evince how little dependance is to be had on writers, who have neither hypothesis nor fact to ground their opinions on; this same orator has proposed to give us the process, but so far from answering the end in view, that not one word is mentioned, of either the mode, or effect of fermentation without boiling.

Here we are in the dark again, as to practice; but in theory it seems extremely plain, that if a sufficient fermentation may be so attained as to dispose assimilate, and intimately blend the water, oils and salt, and better if effected spontaneous, without the aid of yeast, it does not appear in what consists the utility of boiling the wort.

The process will then stand thus.—
The heated water—the mash—the fermentation—the cleansing; and if this process

process on experiment proves just, much labor and expence will be saved, especially if all is completed at one extract; for as to the resinous quality of the hop, and for the solution of which boiling seems materially intended, it may only be managed here, as one would with all private families to do, whether the wort be boiled, or not; that is, to make the extract from the hop separate from the wort, except the reserved part, for the malt extract to pass, in order to prevent roapiness, or taint; and as this book is principally intended for the use of private families, that however this theory may, at first sight, be relished by the prejudice of custom, it is evident enough, that an experiment cannot be attended with any kind of hazard, for early drink, if the fermentation be as amply perfected without, as with boiling the wort, the only point in question, resting solely in this, Whether it be absolutely necessary to boil the hop? but if it shall appear, that much cleaner drink is made by a separate extract, as that may be done to what ascertained height the agent pleases, which perhaps in boiling cannot be so certainly effected,

effected, nor can perceive, even for keeping beer, wherein boiling is necessary; at last it remains to consider, if the passing of the extract through the hop, as is said to prevent roapiness, may not have so much corrective power over the spirituous acid, as to interrupt fermentation, and then it should seem that some yeast must be necessary; but not any thing like the proportion when all the hop is used in boiling; but if the whole of the hop extracted, intended as a future preservative, be passed into the working tun, with the malt extract, it is evident, that much the same quantity of yeast will be necessary, as if the wort was boiled, or no expectation of the drink's keeping a twelvemonth, or perhaps more than one month; this, however it respects boiling, is clear enough to evince the necessity of an additional acid, to give the wort a fermentable power, unless it shall appear, that after fermentation be finished, the hop extract may be properly applied, which, as it is not customary, experiment can only determine.

We shall see presently, whether this may not be effected with propriety, as I have

have always found, that the hop-extract, without boiling, in a proper quantity, has ever been a better remedy for recovering stale drinks, than any testaceous powders whatsoever; that testaceous powders will have the same immediate effect is true, and equally true, that such remedy is but partial and transient, which is not the case in the application of the hop extract; and altho' the proportion cannot be ascertained but by experience, as the degree of staleness must first be known, yet it seems to prove conclusively, that, the like application of the hop extract to drink after cleansing and a finished fermentation, may equally preserve the drink, as if boiled in the wort, and to a much better purpose, as it respects time, labor, expense, taste, and flavor; for as the main purpose is so intimately to blend the acid and alkali, as that neither be predominant, if present spending is the intent, or time of keeping in view, you have by this means at command, as it were to a day, when your beer is in fine order, without any other mode of precipitation whatsoever, attenuation, or

division of the gross parts being previously performed by ferment.

And here I shall venture a singular remark, that I conceive will sufficiently justify this hypothesis. It is, that beer brewed on the approach of winter, is usually expected to ferment again in the spring, having at that time, either gathered more external air, or having more internal acid, than aptly counterpoises the hop, in which the prepared hop extract being at command, this improper ferment may be either timely prevented, or, when in ferment, permitted, or impeded at pleasure; so that every one in this particular may use their own judgment's dictate, whether it be best to suffer, stop, or avoid any kind of ferment at the usual season.

I am sensible that gross hops, and other ingredients, are to this purpose sometimes applied, but on very uncertain principles; as it can never be presumed, that the hop in such case can operate to any material effect, as there is not any inherent power in the drink to form any effectual solution of its resinous juices, and only its natural attractive power in force to imbibe the fermenting

menting acid, which wheat, or bean flour, would equally effect, but will not in the event produce a like consequence, as the hop extract, ready prepared for an intimate association, or involution; and am apprehensive, that the using of the hop extract in the case only will, when duly considered, appear to answer every requisite purpose.

What makes this hypothesis more meriting experiment, is the various incidents that occur in the nature, quality, and management of the respective ingredients before they come to the brewers hands, that cannot be so well remarked and remedied in a complex, as in a more simple process, nor can the accidental evils resulting from the former, be so readily retrieved, as from the latter; nor is the latter so liable to accident as the former; and this naturally leads us to enquire, to what disorders, and to what cause, drinks are subject.

Casual Distemperature in BEER, the Cause and Remedy.

We have a certain criterion, by which we can so distinguish malt liquors, as to determine their perfect, or imperfect, state; from which, as it happens
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to vary, either by misconduct or accident, is termed distemperature. The general rules are, an agreeable flavor, even taste and transparency, and when defective of the latter, is always failing in the former; and if transparency is brought about by time, or art, it is usual to be successful in the former.

It has been observed before, that the pale drinks come round of themselves; the brown commonly require forcing; this is supposed to be owing, in the first instance, to the drying of the malt; and in the next, to the boiling of the hop; from whence the coarser oils are violently extracted, and produce in brown beers the following disorders, a *Stubbornness*, that is with great difficulty precipitated; a second instance, is what is called *Grey beer*, on the surface of which swims an oil, that must be attenuated before any prospect of precipitation takes place; the third instance, is what the brewers call *Cloudiness*; and this is generally deemed incurable by any of their chemical nostrums; to which disorders the pale drinks are not subject, as being neither in the kiln so high heated in their malts, nor their hop so violated in
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the boil; so that those who only use the fine malts, and are tender of forcing the hop, have nothing of this kind to guard against, nor probably would it be so with those who use the brown malt, if they did not use the very worst, and so unskilfully torture the hop.

It must be noted, that even in the first instance of stubborn beer, it is not capable of being fined down, until a kind of ferment is first obtained, to break the coarse oils into the body of the drink, by mixing a large solution of isinglass with oil of vitriol, and this more than once usually repeated.

In the case of *Grey Beers* a triple quantity of the like mixture is requisite, and at last, perhaps, *Aqua Fortis* necessary, to make them precipitate; the great misfortune is, that the precipitation is but partial, as such beers are never bright,

The *Cloudy Beers* seem to be above the reach of cooper and chymist to reduce at all; and those who attempt it are drove to the pitiful shifts of coloring them with calcined treacle, to deceive the unwary drinker,

Is it not very extraordinary, that when
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it appears to the brewer himself, what the true cause of such diseases are, that he will not avoid the error, when it, at sometimes, profit may result, from a bad or overtortured commodity; yet, as the reverse forms an interchange to his loss, and his reputation always in question, not to say something more, one would naturally conceive, that when the remedy is so much in his power, the avoiding improper ingredients must necessarily occur, as the basis of the disease is certainly known. At the price malts are now at, some excuse may be admitted, where profit is in view; but in private families, persons of fortune, who have nothing in view but an agreeable drink, to brew coarse malts and boil hops, as evidently productive of the evils prementioned, is wholly inexcusable.

It has been often repeated, as agreed by the most adroit practicers, that pale or amber beers never prove *stubborn*, or want any force or artifice, but time, to bring them into proper order, much less such as are *grey*, or what is something worse, *cloudy*.

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The last is, by universal opinion, [totally incurable, and after various remedies attempted to no purpose, the drink is lost; on these considerations it is, that an hypothesis may be formed, without the reflexion of being whimsical.

It is said, that the coarse oils which cause the disease, need a powerful attenuator to reduce them to an even quality with the associate liquor; and that the remedy appears not in sudden or hasty violence, by coöperation or chymistry, but it does not appear that the application of simple menstrums, and some labour, may not effect a cure, in which light a plain experiment may merit attention.

The business seems to be, to reduce the super-powerful heated malt and hop, to the like degree of heat, as pale or slack-dried malt, and unboiled hop, naturally arrive at; what may effect this, must at the same time attenuate and blend particles of a seeming different quality; this must be an acid in quantity and quality sufficient to the end proposed; it is said, that aqua fortis, in any safe quantity, nor perhaps is of the right quality to effect it, nor any thing chymical

mineral whatsoever; but it does not follow, that however strong such acids may be, that those of another kind may not have a proper effect.

Acids are as various in their operations and effects, as the modes of production, that gives birth to their existence; cream of tartar, is not the like kind of acid, as the spirituous springing from the ripe grape, tho' deduced from the same fountain, nor will either aqua fortis, or oil of sulphur, operate in thick worts like the juices of our own fruits duly proportioned; and to be considered with this singular distinction, that the former may be the cause of much mischief; the latter a salutary benefit.

This argument concerns only such as brew from brown malts, of the sorts that are too highly heated, and that violate the happy natural quality of the hop, by an excessive extract. But as such cases may often occur from a custom in brewing, an intimation of the remedies may not be omitted. For the first class, called *Stubborn beers*; in this the brewers dissolve eight pound of isinglass in stale beer, to force one butt, and when that will not effect the cure, often

often repeated, six ounces of the oil of vitriol are added, and that failing, eight ounces of the vitriol concrete are mixt and applied.

All these failing, the next term is *Grey*; in this case the quantity of isinglass is trebled, the vitriol increased to twelve ounces, and a small portion of *Aqua Fortis* immixt; and here art determines, as to any absolute remedy.

When beers are in so opaque or dark a state, as to become incurable, they are termed *Cloudy*, that is, are so replete with floating unattenuated oils, as to obstruct the power of vision, and appear muddy; as this disease may not by any known art be cured, the coopers trick then is to apply salt of steel, and this giving it a flowery head, makes it pass common observation, and copperas answers something a like purpose, but gives an ugly yellow cast to the liquor, that is at once nauseous and unwholesome, and this heightened again, by calcined or burnt treacle.

These are the arts of men unstudied in the philosophy of nature, that have never reflected on the true cause why beers ferment at all; it being evident,
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that oily substances never ferment ; and when such are over powerful in the liquor, can only be attenuated by fermenting acids, internal, or external. We know that all acid fruits will ferment naturally, when immixt with genial oils, so their power be strong enough in the contention to obtain victory ; when sugars are added to fresh fruits, a ferment ensues, the oils of the sugars are suddenly dissipated, and an even vinous quality is the consequence. When fruits are full ripe, or sufficiently matured by heat, they have an oil of their own that answers the same end ; so are wines in warmer climates spontaneously fermented ; it should then seem just, that if acids of a natural form, and in a sufficient quantity, be employed, they must in course produce the ferment required, without any improper or insalutary hazards.

The fourth stage of disease in beers, is usually termed *sick*, or flat ; I am not sensible of the true cause, an ingenious writer supposes the want of external air, and propounds the altering the situation of the cask, by turning it upside down, and by so throwing the lees into the
body,

body, to throw it into a ferment; as this disease seems of the lesser kind, the cure may with more facility be effected. In small quantities common experience informs us, that external air is the cause of flatness; but if that be wanted it seems easily obtained. I am apprehensive that the true cause is, the liquor not having been duely fermented before or after cleansing, or perhaps from some defect in the cask, or from both; but whatever the cause may be, if a fresh ferment will recover it, the remedy is very plain.

In the preceeding stages it has been presumed, that the disease, more or less, has resulted from the superiority of the oils floating unattenuate in the liquor.

In this fifth stage we come to consider the acid as predominant, as having by time gained the ascendant. This is termed *staleness*, and is only to be partially cured by testaceous powders, or such like alkali's, but has sometimes an odd kind of remedy applied by brewers, which is, to blend about an eighth part with new beers; this in effect spoils both, but as it comes early round, is well enough to put off to such custo-

mers as only purchase beer by the single butt, or that have not guiles in store, it flattens suddenly in the drawing, has always two tastes, and is very apt to prejudice the bowels of those who drink much.

The usual remedies are calcined oyster shells, with salt of wormwood, unslacked lime, salt of tartar, salt of wormwood and ginger, and such like, all which may in some measure answer; but if such beers be not gone too far, it seems to me very plain, that the most apt and natural remedy is, what the liquor craves, that is, fresh hops, or their decoction; it is impossible to prescribe quantity, as that must be conceived from what degree of staleness the beer is arriv'd to; but as all these things flatten the liquor, in proportion as they absorb the acid, it is probable, that an intermixture of bean or wheat flour with treacle, may recover it to briskness; and as this, at last, is only proposed for present spending, any of these remedies may answer; I take the hop to be much the best, and have tried them all.

Beers in the summer season are often on the fret, and if then wanted, will not

not readily fine down with common precipitants; so that something of the like kind, as in stubborn liquors, is usually immixt with the isinglass, at first gentle, as cream of tartar, about the quantity of two ounces, and that failing, four ounces of oil of vitriol are used in the successive finings, which generally conquers the fret.

Those who make beer for sale, and draw out too great lengths, by which it necessarily fails in strength, attempt to give it a heated body, by using half an ounce of *coccus indicus*, in the customary precipitants on fining, as likewise melassus, ginger, grains of paradise, and such like; all which are said to add greatly to its strength.

As to the melassus, either a large quantity must be used to answer any important purpose, or it will not avail; and if such quantity be used, the value seems to overbalance the intent, which is, to make low beers of equal esteem to those brewed to a proper body.

What grains of paradise, or *calamus aromaticus*, may add to the strength of beer, I am not informed, nor do I conceive that to be the purpose of its

application; the calamus or sweet flag is a fine bitter, with no disagreeable flavor, and is sometimes used instead of the hop; when the price of that commodity runs high, it is usually boiled in the wort with the hop, and is supposed to save about one pound in six, and is thought innocent.

These intimations, tho' they chiefly concern brown beers, are of necessity to be sometimes used in pale beers, that are sick or flat, and ought therefore to be so well understood, as when absolutely wanted, to be employed as best judgment may direct.

The pale beers, tho' of themselves falling fine, and in such case not needing the aid of art, yet as they may become by time or accident stale or flat, some remedy is likewise requisite. It has appeared above, that what cures staleness creates a flatness; and as the latter is consequent of the former, if we can give a remedy from common practice, the end will be fully answered, first presuming, that whatever common malt drink is so prepared as to be extremely brisk, that the like preparation will be the means of recovering flat beers,

beers, and of this brisk kind is the western *white ale*; and as such preparation is supposed to have nothing in it but what is salutary and nutritious, the parallel seems to best answer the intent.

WESTERN WHITE ALE.

This drink is prepared from pale, slack dried malt of the lowest quality, and without the use of any hop, or other alkaline preservative, as being for spending immediately after fermentation, which is brought about without yeast in the following manner.

When the extract is drawn off into the *wort tun*, a paste is prepared from wheat flour, bean flour, or malt flour, it matters not which, except as to body; either of these flours are made into a paste with white of eggs, and being thrown into the wort sets it a fermenting, whence arises a fine white froth, which no sooner falls than the liquor becomes drinkable, tho' not fine, nor is usually permitted so to be, as it then turns stale, but is for the present extreme brisk and agreeable.

This is not cleansed into casks as other ales, nor is a wort tun, as above-mentioned, commonly employed; but

as great neatness is requisite, it is most usually let down from the mash into glased jars, called steens, and worked in, and drawn from them for use.

As we see by this process what may be effected, in order to produce briskness in malt liquors, tho' more of the like preparation must perhaps be used to ferment old, than new beers, yet it seems to follow as a necessary consequence, that the same mode of operation will have the like effect on the one, as on the other, without the least hazard of health.

What gives me a high opinion of this preparation, is, that all over Flanders, an ale of the like kind, in taste, and color, is drank very freely by the ladies, and seems the cause of their plump and healthy appearances. Whence I conclude it generally good, and if it will remedy flatness in old beers, merits a serious attention, and the more, as the experiment is cheap, safe, and readily put in practice.

Fermentation is likewise often procured, by an immixture of lees of wine with wheat flour, and is so used in warm climates to leaven their bread, or what

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our bakers call setting sponge. That a strong ferment may be thereby obtained is out of doubt, but how far it would operate in the producing brisk action in the beer, is what only experiment may determine; it will certainly have as good an effect as cream of tartar, and is, for one reason, much more to be depended upon, as cream of tartar, tho' deduced from the same source, is not commonly to be had genuine, and as being sophisticated with allum, is not rightly calculated to the intent of recovering beers upon the fret.

It may not be amiss in this place to give one useful hint, as all that can be said is not more than sufficient to furnish our tables with an agreeable substitute for wine and water, and equally calculated to answer the end in view; it is to give the preference to wine casks, where they may be obtained, for the following reasons.

The casks usually employed are either new, or old, that is, have had beer in them before, or when new much labor and time is required to wear off the taste of the wood; and if old, are rarely so neat as is requisite; and in either case

produce taint, or disease in the liquor; but wine casks, the white wine especially, are not subject to the like consequences; they are likewise well closed in the staves, and retain an acid spirit, that at once give life, vigor, and flavor to the drink; those in which sherry has been are the best, but any are better than beer cask, and may generally be had cheaper.

Hence springs a conception that may not be improperly brought to the common account of manufacturing fine beers. I presume it to be generally admitted, that the more vinous flavor beers acquire, they will not only be more pleasant, but also more salutary; and if they may be so improved, as to obtain this end, may become at the same time agreeable to our palates, and constitute a manufacture, that may prove of importance to the wealth and happiness of the community.

If there be any dispute in a man's mind, whether malt extracts, and those from vinous fruits, will operate properly together, the fact is too plain from experience to leave it a question; and as to any doubt, whether vinous fruits of
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our own growth will have a due effect, a very easy experiment will solve.

We really want a fine liquor of our own for the ladies, at an easy expence; and I hope common prejudice will not acquire such a predominance over common sense, as to pervert a well grounded hypothesis, into whim and conceit.

We find our beers, in the present mode of manufacturing, calculated only for such, as use much exercise or labor; in others, they not only create a kind of indolent sottishness, a scorbutic lassitude or weariness in the joints, and men that drink much, of the heavier and softer kind, become gradually pale and sickly, breaking out into the like kind of disorders, as those who delight in rich fauces.

If it be asked, why it happened not so to our ancestors? my answer is, it did the same to those who lived equally sedentary, or idle lives; and that the preservation of thousands in the present age has been owing to the super expence they have been at for wines, and being satisfied with plain food, and store of vegetables, such live still without disease, while multitudes fade gradually

away, without the least surmise of what has injured them.

Fellows of colleges, and such like sober people, who are fond of soporific draughts, if their natural stamina be sound, live sometimes free from external humors longer than their neighbours; but it may be observed, that an uncommon drowsiness ensues, that distinguishes them from men in active life, and who are curious in their drink; it is the same in the trading world, that have more uncorrected malt and hops in their bellies than activity in their limbs, or that do not enjoy a free air, and ample respiration; fox-hunters, porters and coalheavers, tho' they drink much, physic it off by sweat; and as to country labourers, as they cannot afford the like quantities of high brewed drinks, their natural physic moves hand in hand with their work and plain food so as rarely to be troubled with those kind of scorbutic evils, which affect numbers that can better afford to dye, with diseases of their own forming.

It is agreed by all who have considered the subject, that a superfluous boiling of malt and hops, especially the
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high heated malts, produces a quantity of the coarser oils, insomuch as not only to absorb the spirituous, but likewise to involve the qualities of both in the common destruction; hence the several degrees, of the stubborn, the grey, the cloudy, beers, and which of the least diseased are not to be recovered to perfection, by any chymical arts or cooperage; may it not then with good reason be concluded, that either less heated malts, and less boiling of both malt and hop, should be excluded, or some vinous acids in such course immixt, as may counterbalance the evil, especially if profit obliges the brewer to run out too great lengths in the extract, and acquire by such profit all that is nauseous and contemptible, to cheat the swine of their due, which Providence intended for their regale.

It may be objected, that if vinous acids will with propriety immix with the malt extract, that such drink will not keep a due time. I say, doctors doubt that, as I have known wines from English fruits only, keep full as long as any beer ought to keep, and longer with a body of malt than alone, which I conceive

celve will not be questioned when duly considered.

Whatever gentlemen's fancies may be to have long keeping beers, it seems not to be the brewers interest whose view is profit; and tho' I could wish, for health sake, that gentlemen would not consider long keeping beers as an act attended with rectitude, however it may affect their vanity, as the two most important seasons come speedily round, and a judgment easily made what the brewers may want, I should think, that a super store of six amply sufficient; but in this I presume not to dictate, but merely as it respects the point in question, whether the use of our own vinous acids, would not only save them labor and hazard, but at the same time give health to their customers, and be of extensive benefit to the trade; at all events an experiment may be made at a very small expence, both with and without the over forcing the malt; though I can tell them, without the spirit of prophecy, which will have the best effect, both for profit and health. And that this my hypothesis may be more thoroughly understood, both by the gentleman, and common

common brewer, I shall make some observations, on the nature and qualities of our own acid fruits, simple or immixt with other bodies, as have presented to me in practice, or have been the result of well grounded information; and tho' not correct parallel, may be sufficient hints, to such as have a pleasure in being informed.

Elder berries are said by the brewers to be only used as a coloring to the drink, and perhaps only used in London; and tho' I much doubt the fact, because I have known them have a very different effect, yet admitting the brewers assertion, they are no doubt the least vivid of any fruits we grow, but am afraid the fine latent quality of this berry has been misunderstood, by a defect of quantity, so that when only a slight flavor has resulted, it may have been supposed from some other cause, the brewers great skill, or what not, but I have known two bushels of this berry turn the extract of six bushels of pale malt into a very good hoghead of strong wine, without other commixture. The truth is, that the quality of this berry is hid, it produces a thick heavy fluid,
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that without quickning moves on very slowly to perfection, and so would the best sherry wines, and even run roapy, if not broke by thinner bodies; after fermentation it emits a strong vinous flavor, much resembling the coarser clarets, and of some Spanish wines; if quickened with livelier juices, the currant or such like, some decoction of the hop may be necessary, to preservation for time, but merely as it respects the malt wort answers sufficiently alone, it is in body much more powerful in proportion than the malt extract, and requires a boil to open it of about fifteen minutes; it is not the best fruit we grow for the purpose, as will be seen presently; but if the white berry be used, and the brewing moderately flavored, by a decoction of the elder flowers, the product has more the resemblance of Frontinac than may be readily conceived, tho' not quite so justly as the following.

It is a little deviating from the point, to mention another kind of manufacture, that has nothing to do with malt, and is neither properly fruit, nor but partly our own produce, and is equally common to all nations. This digression is
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made to evince, that we do not employ the gifts of Providence to the best advantage, and that a wine more nearly resembling Frontiniac, than from the elder berry and malt, may with facility be obtained, and has some consonance with the practice of brewery.

This is a composition of honey, raisins and elder-flowers, boiled up with water, and fermented in the same manner as malt liquors.

The chief use of our honey, as to drink, is in what we call mead or meath, compounded only of the manufacture of the bee, water and spices; it is in that state neither a very wholesome or palatable liquor, its oils are coarse and strong, and require time to digest into any kind of utility, and in its best condition, is but very moderate; it is probably not much mended by a fermentation with yeast, which only add to its coarse quality; and as the breaking of this is requisite to its becoming vinous, and fruits are a very apt and natural remedy, capable of improving it into an agreeable wine; but as that practice has never yet perhaps been considered, the aid hitherto given had been by dried grapes, which certainly
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make it a much better liquor, than when brewed with water only, and the elder-flowers are meerly to give it an imitative quality of Frontiniac, which it nearly resembles.

Its oils are coarser than from fine pale malt, and participates much with the high dried, and with those of our boiled hops; how much time would wear these off I am not aware, as not being usually considered as a keeping liquor; that it abounds with acid salts is obvious enough; but as they are much overpowered in the first instance, by those strong oils, it may be long before reduced to an even palatable vinous fluid.

Honey, as to its body, is equal to a strong malt extract, and more nearly resembles its nature or quality, than is generally imagined; its aromatic power is superior even to the prime decoction of the hop, but that is too high to be grateful to the palate, as being like other perfumes, most agreeable in a very moderate state, and therefore to be at once agreeable and wholesome, must owe its rectification to more vivid juices, and those of our own product will no doubt have the happiest effect, whether from
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the grape, the currant, the bollafs, the damfin, or the cherry.

As to any rule, in the order and application, it can only be general, the seasons being here so various and uncertain; but as the business in all such compounds is, to bring the liquor to an even and agreeable taste, it will only happen, that the more or less of the vivid juices applied will bring the wine sooner or later round, without any other hazard, or inconvenience, and the same whether boiled or not, but if afterwards it may not ferment naturally, it were to be wished, that something might be used rather than yeast to set it a working; and if it be found to ferment too high, so as to fret away its spirit, as may be the case when the vivid juices are too predominant, the best remedy is a pint; or to a large quantity, a quart of proof brandy, no matter whether French, Spanish, or English, the first may least injure the flavor.

A THEORY *respecting* BRITISH FRUITS, as applied to the improvement of MALT LIQUORS.

The taste of the English being generally more in favour of simple than compound

compound qualities, in their common diet, especially such as they have not been accustomed to, it may be no easy matter to persuade them to a variation in the mode of their malt drinks, however just it may appear to their reason and judgment, but when they reflect on their only favorite composition punch, and consider the sequent theory, it may happen to change their opinions, and give them a taste for further experiment, in particular those who prefer their own health and countries welfare, to an indolent habit of prejudice.

It is commonly known, that elderberries work well with malt, and when rightly applied answer an important end, honey would no doubt operate very well, but its luscious balsamic quality, is perhaps too high, when used with malt, to be easily forced into brightness in the liquor; dried grapes may have somewhat the like effect, and both would give the drink a vinous flavor, but the latter much more clean and agreeable on the palate, and produce a much lighter drink than malt alone; our other products do appear in the same light, our malt alone has a strong body, but flatulent effect;

effect; our native juices a weak body, with vivid salts, therefore to give a quick active spirit to our drinks, that an incorporation would produce what may be reasonably expected, both as to health and pleasure.

As to health, it is generally agreed, that malt extracts, especially those of the grosser kind from high mashing, are as apt to create scorbutic humors, as rich gross foods; and it is as generally agreed, that fresh fruits are the reverse; it seems then, that an intimate and judicious incorporation of malt and fruit extracts, would have a happy effect.

Our fruits are apples, pears, the large and small white plumb, the damson, grapes, currants, gooseberries and Morrelli cherries.

The *apple* is not generally to be recommended in this particular, as it makes an excellent antiscorbutic liquor of itself, is sufficiently plentiful to be used alone, wants not a good body, and is of too austere a quality for the purpose in view, a particular species, high ripe excepted.

The *pear*, is not absolutely eligible, without the aid of more spirited salts,

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or much time to bring it round; its extract alone has somewhat the semblance of Champaign wine, and sparkles like it, but has notwithstanding an austere quality, that would but ill commix with the coarse oils in the malt.

There are various fruits besides those pre-mentioned, that being too weak and flatulent, would not be of benefit tho' of a much higher flavor, as Mulberries, Rasberries, Strawberries, and such like, and our common hedge berries are too austere, costive and immature for any use in fine drinks, tho' one of them very injudiciously used by the wine brewers, who might have discovered a much more apt fluid, than could possibly be produced from baked sloes.

The large white, usually for its seeming likeness in shape, called the *Egg-plumb*, only ripens to maturity in fine seasons; and if we could from it prepare a good vinous fluid, it is not at present cultivated in sufficient plenty, tho' enough may be had to mix with other bodies; its juices produce a wine of the Rhenish kind, and possibly as good in a state of perfection, but unripe requires the soft oils of sugars, to give it a palatable

table pleasantness, and in a proper quantity would operate well in a malt extract, particularly in the distillery, producing an effect not common in British spirits.

The small white or bully, is of much the like kind as the Egg-plumb, in taste and flavour, but is more plenty, ripens better, and not having a sufficient body of its own, is applied with the Belvidere raisin, to furnish out the manufacture of Rhenish wine as usually imported from Hamburgh, and might be turned to a like account here, in the same manner, or for a curious summer drink, with the malt extract, to counterbalance its sprightly salts, and give it a proper body.

The *current* is of a more delicate texture, oils are soft, its salts brisk and spirituous, and its seeds or kernels, when bruised with the fruit, have together a pleasing palatable relish; it would make of itself a very agreeable wine, if the cultivation and quantity might be found to answer; but that not being presumed, a pretty light wine is usually prepared from a proportion of water and refined sugar, so that it is not so much supposed to want body, as sufficient quantity to
answer

answer any material purpose; and the malt extract when drawn fine, will suit something a like end as wine, or a beverage so much resembling it, as to prove an agreeable antiscorbutic, and may be so applied, as to produce the resemblance of wine properly so called, it may prove a manufacture of great consequence to the nation, in which light their utility seems to merit regard.

But of all the fruits this country produces to any degree of perfection, that which claims our highest esteem, that best suits a composition with the malt extract, and that most resembles the best clarets in taste and flavor, is the *Damfin*, as it may be cultivated to a more advantageous purpose than any other, its body is powerful, its oils somewhat coarse and rough, and obtains its sprightliness from time, and a happy fermentation. Those who use this fruit simply, ferment it with sugar, but with the malt extract will ferment alone, and its best preservative afterwards will be a due proportion of its own kernels bruised, and that proportion only known by experience, as it depends on the quantity used in the extract, and the
time

time for coming round required ; it may be so prepared as to keep many years, or to be drinkable in as narrow space of time as him who employs it pleases.

The nature of this compound will not be subject to the like necessity of keeping, as wines made entirely from the grape, as it does not imbibe the like quantity of air, nor consequently require the same power of fermentation; when new wines are boiled, as sometimes happens to be the case, when slack vintages happen, and the fruit proves immature, these come round earlier than is common to ripe fruits, and are drinkable within the year, which the latter are not, nor generally in less than two years, and it will be seen in the sequel, what the nature of the operation in these several cases preceding will be to prepare the respective compositions for coming round early, or for long keeping as may best answer various intentions.

I have not hitherto mentioned the grape of our own produce, as it either is presumed to not answer in this climate as used alone, or is generally planted for the like purpose, as peaches, nectarines,

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&c.

&c. merely for pleasure; and as the expence of cultivation, rent of the land, and hazard of the seasons, are the means of their not answering so well as various other cultures, without considering that the land proper for the vine, is of the least value of any, nor will commonly produce any thing else, that may materially turn to account, nor is it usually considered what kind of vine is proper for this climate.

It is certain that our seasons are precarious, not only for the wine, but for all other kind of fruits; but be the seasons ever so precarious, it will not essentially hinder their being used in the malt extract, as only a less quantity, or more fermentation, will be requisite to the perfection of this kind of composition; there is no doubt, that the more mature the fruit may prove, the better it will be, both as to management and taste, it will avoid vicious, and untimely ferments, and all the consequent effects; but this we shall likewise consider in the process, so as to regulate the effects of bad seasons, by a very easy attention, and common discretion, so as in some measure to make all seasons nearly
answer

answer alike, whatever kind of fruits are used, and that may as effectually answer the purpose of the common brewer, as the gentleman, or private family of a lower degree. My view in this is at the same time health and profit, and hope it will have the happy effect of producing a new manufacture that may prove of public utility; and as many may conceive new experiments hazardous and uncertain, they may be informed, that this is not in the nature of expensive projects, as the effect may be as well experienced for five shillings, as for five hundred pounds, not that a small quantity can be presumed to answer as well, as what will produce a body, but it will readily evince the effectuality, and three months drinking prove the salutary effects, especially in the spring.

I have omitted speaking of the *Morrelli-cherry*, as being of somewhat the like nature as the *Damson*, but seldom arrives at the same maturity, without more care than usual in the planting, and not being apprised of its eventual effects, other than that it produces a rich vinous fluid, but resembles not in taste or flavor any wines that I am acquainted with,

except one species of the Biscayan, seldom drank in this country; if it be found to answer in other respects, it is to be wished, that more heat of the sun might be given in the placing it; and if that cannot be afforded, I am apprehensive, that no quantity may be raised to answer any important purpose.

As to *Goosberries*, I do not conceive they have power inherent to answer the end proposed. The women make with them a pretty vinous fluid, as with currants, and so employed, may best answer their natural properties.

The Process of MALT and FRUIT EXTRACTS.

The three malts in a proceeding discourse considered, were from wheat, barley, and oats, and the proportion of body presumed, as four is to six, and of six to eight bushels, as proposed to produce the like value of strength, and therefore whatever quantity of vinous extract is allowed to the first number to make one hoghead of drink, the same must be allowed to the other number of bushels of the respective malts, so that each drink may be equally strong and vinous.

The oat is no doubt the more delicate grain, and will probably turn out the most pleasing drink, and more easily come round without forcing: the best time for this process is most probably in October; but, as some of these fruits come earlier, a proper regard must be had to their seasons, as it is certainly better to have them fresh and in full perfection; either of them may be preserved, but they will faint and be sickly, as whether preserved in sugar or treacle, they will be apt to ferment out of time improper to this process, as an intimate commixture is proposed in the first instance, when both malt and fruit are in their full spirit and vigour, consequently some of this species of brewage must be earlier, some later; but that which is latest probably turns to the best account.

It must be also considered, that the summer-fruits are of a weaker body than such as ripen in autumn, and, consequently, in equal quantities come more suddenly round, so that the currant and such like must either afford a larger quantity of juices, or be intended for earlier use than the damson, that

comes not so soon to perfection ; so that according to the vinous quality intended must the proportion be, perhaps as eight is to twelve ; for nearly so much is the difference between the power of the damson to that of the currant, as may be easily proved and distinguished both as to strength and flavor, by a separate and distinct fermentation, and the farther forcing by boiling, baking, or distillation : thus, and in either of these ways, will an experiment of the power of the respective fruits be made, and by that judgment first acquired, may the raw juices, in their prime state and season, be properly applied, and the process correctly pursued, only observing, that, to avoid the coarse oils of yeast, or the disagreeable effluvia of the hop, as has been previously hinted, the bruised kernels will best supply the place of the hop, and the fermentation better created by lees of wine, if the natural course should not produce a sufficient effervescence.

There is, at the same time, to be considered, the different parts of this island, as to the late or early season for fruits, so as to make the difference of a month ;

month, and most of the earlier may continue on the tree till September, and sometimes later.

The mode of brewing is this, the malt is mashed as usual in other operations of the like kind, but of only one extract if convenience permits; the extract to pass through the kernels bruised of the stone-fruit, or, if designed for currants, through a light decoction of the finer hop into the receiver, and thence into the copper.

One gallon of the lower fruit-juice will be sufficient to ten gallons of the malt-extract, and so on in proportion; but if more be used, there is no other nicety in the matter, than that more will encrease the ferment when casked.

The fruit-juice and malt-extract are to be boiled together about fifteen minutes, little more or less, as the incorporation appears to succeed, by the breaking of the head, or other apparent commixture; the wort is then transferred to the cooler, as in the ordinary course, and thence into the cask, without any regard to a ferment in the wort-tun.

What the incorporation wanted in the boil, must be perfected in the cask;

and if a due ferment then does not come fairly on, to be improved as pre-mentioned, or with white of eggs, and wheat flour immixt into a paste; but if the natural runs so high, as to weaken and carry off the spirit of the drink, the use of brandy will be a sure and speedy remedy: and I think more instructions are not necessary on this head, nor need any thing else be said, only in general, that the seasons be so consulted, as that the malt-extract may require more or less heat from the copper as the state of the air happens to be, which will be better understood as we pursue the sequent subject.

AIR, *its PROPERTIES and EFFECTS on MALT LIQUORS.*

AIR is that power, which, under the denomination of the Atmosphere, incloses and supports the whole body of the terrestrial globe, and all the bodies therein contained, fills up every space, and acts in every part; its motion, as perceivable by the glass, is a fluctuation like the waving of the waters in a rivulet, and replete with infinite animalcula: it is conceived by some who study such subjects, from its activity, that air has a
spirited

spirited fire inherent, which gives it action and vigour; this they call Æther, which may possibly be true; but of this I know just as much, as of that spirited power that gives motion to the animal frame.

It is, however, probably true, and much to the present purpose, as we find the air brightens as we ascend to any considerable height, it gradually fails in its compressive force or gravity, so as to permit the blood to burst from the veins, and in the event destroys human existence; when, if it was simply the same, as we find it in the common order of nature, it should seem to operate to the same effect every where.

As we are placed, the only alteration seems to be at the direction of the winds, that vary its quiescent state into tumultuous motion, which, as such happen, disturb the human frame, and disorders all kind of liquids, as the same are parts of its own body, and as it enters into the most combined solids.

Our books give the weight of water to gold as 1000 to 19636, and of air to the same as $\frac{3}{11}$; in some it is calculated as 1 to 850, air to water. It matters

not much to the present purpose that we be perfectly correct, as neither air nor water are always of the same; as sometimes the air is more replete of aqueous particles, more oils, and more salts, the Barometer gives us its gravity at different times and places, and establishes, as far as is necessary, our knowledge herein.

We are sensible of its elastic power, as not common to the other elements; and that it will occasionally rouse or depress fermentation in liquors, as the strength or weakness of the composition happens to be, and the same in giving spirit or flatulence, to such as have past the ordinary course of ferment, as it chanches to reach the subject, more compound, or more pure and unmixt: in rainy seasons, the aqueous particles, bursting from their confines, bring down with them other weighty commixtures, and leave the air more light and pure, and the more so, when the atmosphere is so disordered, as to violently disencumber itself by bursts of thunder, and dissipation of livid flames: the air in this state of levity is to be duely attended to in the care of our liquors, whether in the copper,

per, the cooler, the wort-tun, or the cask, and the effect as much as possible prevented by an exclusion of the atmospheric emissions.

The judgment to be made in this case may be deduced from the ordinary course of our seasons, in their most serene and placid states respectively; and as we find the air then operate on our liquors, preparing or prepared, strong or weak, for keeping or present use, so we may conclude, on the consequence of any occurring or uncommon violence.

The highest heat in summer suppose at 75 degrees, and the most piercing cold in the winter at 25 degrees, the spring at 40, the autumn at 45 degrees, by the Thermometer; the medium of these, compounded and divided by four, will be the ordinary heat of the air; and as such degree of heat may be found to operate on simple or compound fluids, will be a steady direction how to order them, as to heat or cold, through the whole course of the year, and give us a more ready idea how we ought to act in the two most important points boiling and fermenting.

We have seen that the air surrounds, presses upon, and binds all bodies, and in that light appears the common preservative of nature, and *in vacuo*, by the air pump, we find glass shiver to pieces; and hence it being concluded, that air is absolutely necessary, and can fill only the vacant parts it is proposed to subsist, that whatever we force from thence may be in some measure detrimental, and carried too far, produce a flatulent or vapid effect. Both boiling and fermenting require being well considered, as both create a violent emission of air, internally seated, and impedes for the times of action the entrance of the external; and therefore such operation to be no farther pursued, than either the comminution of parts proposed to be effectually compounded, or the throwing off any heterogeneous parts, that would, if continued, injure the composition; and as in the hottest seasons the ferment will be necessarily strongest, so must the time of boiling be proportionally abated, as they are both intended to the same purpose, a happy junction of the homogeneous compound, so mixed and blended,

as to become one and the same body, without distinction of taste or flavor.

The state of the air is likewise to be considered in the forming of the extracts, particularly as it respects the nature of the *Malt*, that has previously imbibed more or less fire, as in such case more or less heat is required to form the extract; and the same if malt has lain a longer or shorter time in the air when taken from the kiln, as time will be the cause of imbibing much air, and a more ready extract, and therefore needs not the same heated powers to force it.

The water from whence an extract is to be formed, will be of nearly the same degree of heat as the air in the shade; from thence may be readily computed what farther heat may be necessary.

Water is not to be considered as an active body, but as set in motion by the vivid quality of the air; nor perhaps, as has been hinted before, is air an active body, but as irritated by some other power inherent, as being only a thinner or less compounded fluid, and so both air and water of themselves are inert; but as air has a spirit inherent, if that be
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by any violence emitted, an inertion necessarily follows. It appears from a plain fact in practice, as when the internal air boiled out from the wort, it will not ferment, but by the application of some substitute, to attract the external air and set it a working.

The air in all solids and fluids is as the openness or closeness of such bodies are capable of receiving it, which experiment can only prove: as to fluids it is apparent, that those of a more oily, gummy, or balsamic composition, will not admit the same quantity of air as those of a lighter body, less immixt with such gross parts, consequently not so much air in wort as in water; and if air, with its inherent spirit, be the common nurse of vegetable as well as animal life, if that be so, as seems unquestionable, it must be just reasoning, that, by boiling, fermenting, or any other means, if too much air be emitted, so much vegetable life is destroyed, so much imperfection created, and so much liquor spoilt; and it seems very idle to first throw off the seeds of vivid vigour, and then attempt to recover it again by a pernicious substitute, especially as it is agreed,

agreed, that no rule has yet been formed to ascertain the requisite quantity of air, so as to preserve a due equilibrium, it were surely best, that we preserve as much of the spirit of our drink as possible; and the medium appears to me very obvious, which is to boil beers no longer, than as the wort may be left in such a thin and fluid state, as of itself to ferment without the use of yeast, as is agreed will happen of course, if too much air be not emitted: but should it so be, as by many concurring and unforeseen incidents, it may that, in this course, a ferment fails, a vinous fluid immixt will certainly have its due effect.

Fermentation seems to be the effect of air; but as severed from its igneous particles, and subsisting in acid salts, or igneous spirit, or both, that inflame oily substances, and set them in a fret, when such have absorbed more air than they can contain, they become gradually thinner; and, as the power of the air refines them, the water, the acid salts, the igneous particles, and the oils, become a pure and transparent liquor.

This, if any thing we know, is the true cause of fermentation, as appears
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by every experimental instance, and, in particular, from the practice of London brewers, and the nature of yeast, apparently an open body, apt to receive the circumambient air, which having before been expelled and repelled by the operation of heat, is here again recovered to act, perhaps with something more power, than would have happened in the natural order of the malt-extract too violently heated; tho' it be agreed, that no power of fire can force it higher than 212 degrees on the Thermometer.

What is apt to the yeast by its open and attractive body, is natural to all vinous fluids, which contain the like quantity of air as the yeast attracts, and has therefore the same power of producing a fermentation in malt-extract, that have emitted their spirits in the boil, as yeast has, without a commixture of those coarse and ill-heated oils, that, while the air assists the ferment, such oils contaminate the liquors in a manner that too often proves irremediable, an effect vinous fluids cannot possibly produce, and therefore, in my humble opinion, much to be preferred, where health,

health, pleasure, and palatable liquors may be affectionally courted.

FIRE, *its action on Malt and vinous* EXTRACTS.

FIRE, as considered under that general term, is of two kinds, that which is the spirit of the air, and presumed cause of motion, usually called *Æther* or Elementary, and the other produced by attrition, termed Culinary. They may, for ought I know to the contrary, be essentially derived from the same source; and perhaps not inherent, as generally supposed, in some bodies that seem to produce them, it being a question, and may perhaps ever remain so, whether fire, produced by the friction of two bodies, is from either or both of them, or only from the intervening agitated air? And if only from the last, then the difference is only this, that the pure *æther*, having caught an inflammable substance, loses its distinction as elementary, and becomes culinary.

What perplexes human wisdom in this particular is, that certain bodies put together, free from any seeming attrition, yet produce heat, and some even flame, as oil of vitriol and ice, will produce a strong heat, and sulphur, filings

lings of steel, and water, produces flame, tho', perhaps, the reason in both cases may be just as readily understood, as what has been said of air producing fermentation; because there is a secret, in apparent attrition, in all mixt bodies, that produce heat, or flame.

The action of fire upon liquids, passing through the pores of the containing vessel, is the gradually forcing them into ebullition, and here its power determines; by this power the internal air is ejected, and forms a kind of concave over the mouth of the vessel; and tho' in a rarified state repels and excludes the external air from entering so long as the ebullition continues; and as that declines, the body of a malt-extract closes, and when the excluded air is totally evaporate, the extract is so closed, as to admit but little external air; and thus, having ejected its spirit, becomes weak, sick and flatulent.

To recover this, the elementary fire is called in aid, in the manner as is pre-mentioned in the subject on air; hence it appears, that the action of fire, in its various application, reverses the effect, by emitting, and by reviving a spirituous

uous power requisite to fermentation.

Fire, under whatever denomination traced, dilates solid and rarifies fluids, which is only a farther extent of dilatation; and as it gives motion to all kind of bodies, so will it open and expand them; hence it is, that the oils in the wort, being opened by the admission of the external fire, the imprisoned particles acquire their release, the oils become more thin and fluid, and after some struggle in the ferment, blend in common with such bodies, as were previously in a state of more levity, and thence remain totally indistinct.

There are various mixt bodies, besides those pre-mentioned, that act by attrition unperceived, and even produce flame, not as from themselves, as fire inherent, but as operating, on the elementary fire, to the like effect in part, as from the motion of the electric globe; so oil of cloves, or spirit of nitre, act on steel filings, but producing a grosser spirit, than is the result of electricity, so as even to burst into flame; can it be then doubted, what is the true cause of fermentation in malt or more vinous fluids, as ferment is evident attrition but of bodies

dies not gross enough, by action, to produce perceptible fire.

I am the more particular in this, as it seemed generally questioned, what is the cause of fermentation? But it appears plain that dissonant bodies, acting on each other by attrition, produce heat, and some fire, as is common with two sticks rubbed against each other by the power of the hand, and of others that act of themselves, and fret the air into fire, and before these acquire heat and commixture are perceptibly in a ferment, so it may reasonably be supposed to happen, that the like kind of ferment in liquors may be produced by the dissonance of acid salts and oils, or other balsamics; and these in the ferment agitating the fire in the air, a general effervescence ensues, and burst into a kind of ebullition, resembling that which results from boiling, by the power of culinary fire, and therefore not to be any farther encouraged, than to procure an equal taste, and to bring the drink round clear and transparent.

In wines produced only from the grape the culinary fire is never used, but to the juices of immature fruits; nor will those

those which are too highly ripened ferment alone, because their fine salts are maturated into a kind of unctious sweet, or by the action of elementary fire on them evaporated; hence it seems plain, that where ever these salts may be retained in a due medium they will, with the assistance of elementary fire, only fret the oils into a ferment.

This is not in foreign wines generally permitted, their state of fermentation is usually moderated with quick lime, so that the oils are not sufficiently blent with the salts, but float about in the liquor, as sometimes in our beers, and neither are of themselves, nor can be made bright, but by lowering and forcing. This some call adulteration, and may in some cases be truly so, but in general are much the better for forcing in the ordinary way; and mixing the heavier with lighter wines, as by such means, when well blended, they may acquire a bright countenance, come sooner into drinking order, have a more pleasing flavor, and pass better off the stomach than genuine wines usually do; but if small wines are not to be had, and those of a richer kind prove very stubborn,

born, the action of fire is called in aid, as powerfully inherent in oil of vitriol or arsenic, either of which break the unctious connexions, and with the assistance of that fire, which gives motion to, and is imbibed in air, a ferment takes place, and the wine becomes bright, and will hold so, if presently bottled, otherwise it generally, in a few weeks, returns to its former state.

The forcing, and bottling, draws into it a great quantity of æther, which expands itself over the whole body of the mash, acts upon, breaks and dissipates the incoherent oils, and procures an effectual blent.

When a light ferment is only requisite, it is presumed, that the oils and salts are nearly equal, and the liquor in due time have come round without forcing, but not to attain that brightness, which only the spirit of the air conveyed in certain mixtures can give; these mixtures are white of egg and isinglass, separate, or beat up together, with a certain portion of the liquor.

It seems certain, that if fire be the universal cause of motion, as generally admitted, and that from any of these mixtures

mixtures motion ensues, then it will follow, that in stubborn cases, where most motion is required, whatever imbibes most elementary fire, is the likeliest to succeed in breaking the coarse oils, and blending them with the acid salts.

This argument attended to, may be the means of discovering what is the true remedy for cloudy beers, as well as for wines over-burthened with coarse oils, and intimate to us by easy experiment, how much of this vivid spirit may be at all times requisite to produce brightness.

That it is high in all acids is very evident, that it is low, or little apparent in oils or balsams, is equally evident; and therefore when either appear predominant, the remedies are dissolving or feeding, and both on the different occasions tend to the like purpose, equal taste and complexion.

WATER, *its NATURE and PROPERTIES.*

Air and fire, I presume, may have been sufficiently considered as to the purpose in view, water is compounded of both, and various other casual matter, so as never to be procured pure, participating of every thing it touches:
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and tho' in its most perfect state infinitely heavier than air, yet passes through certain pores with more facility than air, which may be contained in a bladder, but water will find its way out, and the same through the pores of leather.

It is supposed an univereal dissolvent, but that seems a mistake, as oils will dissolve resinous gums, which water cannot effect; so will sugars ooze through the same cask that will retain water.

The properties of water are owing to its component parts, natural or acquired; its pure composition is formed of air and salts, what other particles may casually adhere distinguish its particular use and application, with or without a mineral tincture, for drinking alone, for vegetable extract, or for the laundry; but how it respects the present purpose is to be singularly considered.

This element, however primarily composed, is exhaled in vapor from that great abyss the ocean, and lesser liquid streams, in its lighter state, quitting its terrene parts and weightier salts, mingling with the æther, and forming itself into clouds; as these exhaled vapors increase, and grow too weighty for the

the air to support, or are precipitated by wind and fire, the clouds burst, they fall in showers, and the earth is replenished with moisture; the parts that fall on the higher lands either trickle thence down their sides, or are conveyed by latent conduits into the plains or lower grounds, some remaining under ground as in wells, some bursting out in springs, and some flowing in rivers or lesser streams, always moving horizontal, as one of the express properties of all liquid bodies.

When waters are so conveyed from the hills through latent conduits, whatever happens to be the nature of those hills from whence they flow, such will be, in some measure, the nature of the water, as from chalk hills, soft and soapy, from gravels, sharp and quick, from sands clear and transparent, they find with difficulty their way through clays, and when they do are muddy, but somewhat saponaceous, especially if the clay be of the marle kind; any of these waters may be adapted to the brewery or laundry with a little management, and all require some care and settlement.

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As to such as pass through sulphurs, steels, alums, &c. &c. as they participate of the like qualities, are rarely applied to the brewery, and never to the laundry; I have known some mineral waters used in malt extracts, but only for particular purposes, that have no share in the present subject; what is right for the laundry will always be proper for the brewery, and both equally require transparency, especially fine malt liquors, tho' not so much regarded, in brown malt extracts.

The naturalists are very nice in their distinctions between fluids and liquids, and esteem water, as only a kind of fluid, which assume the figure of the vessels they are contained in, and always have their upper surface parallel with the plain of the horizon; and such likewise are oils and mercury, consequent, as they say, of their weight and intestine motion of their parts every way, which motion appears from their dissolving hard bodies; so aqua fortis dissolves copper, and that what strong waters are to hard bodies, other liquids are to other substances,

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This may be very true, but as to the motion, which seems to be the power that causes dissolution, is not so properly the water, as that inherent spirit, which is the soul of its component parts, air embodied with vapor, actuated by a kind of electric or ætherial fire, which indeed seems to be the same in every vivified subject; hence we may conceive or estimate the value of pure water, as unmixed with other matter than vapor, air, and æther, in which perfect state it would be much lighter than we ever find it, as the purest I ever met with, will weigh fifteen ounces to the pint measure; and if in that state of levity it may be required, will certainly best answer the purpose, of either malt, or vinous extracts, as more penetrating and dissolving than liquids, in a higher degree of gravity, consequent of more weighty mixtures, as will be the case in some seasons of the year more than in others, by an intermixture of nitre, even in its falling from the clouds, which is generally understood to be its purest state.

*The THERMOMETER; its Use and Application, in
the BREWERY.*

In the course of this work, the thermometer has been often mentioned as a proper instrument to ascertain liquid heats, and as this work is chiefly intended for private families; many of whom may neither understand, nor be aware of its utility, it appeared to me extremely necessary to delineate its nature and properties.

That the thermometer is considered as an instrument of consequence in natural knowledge may be in some measure conceived, from the pains that has been taken by the best mathematical heads to bring it to perfection, as by it, and no other certain means, we come to be informed of the true state of the air, in the course of its several gradations of heat and cold; and thence enabled to judge, how to use or apply such or such matter, simple or immixt, as may most certainly answer our purpose in view, and that makes it as necessary in various other cases, as in this the subject in question.

The discovery of this instrument has been ascribed to many, and it is most probable

probable in this, as in many other cases, that none are the full discoverers, but that time and application have gradually produced it, into that state of perfection, in which it now appears.

It is said to have made its first appearance here nearly in the sixteenth century; but not being, as now hermetically sealed, or stopped with the like metal, as that of which the tube is composed, the inclosed liquid was influenced by the pressure of the air, and effect of the heat or cold; but this defect being soon discovered, that remedy was applied, and the instrument came into credit; but at the same time the gradations being only calculated, to this or that particular climate, the next employment of the best heads, was to make it of general utility, by the means of some standard fluid, capable of acting in the like manner universally.

The great Sir Isaac Newton esteemed this as a matter meriting his warmest attention, as did Halley and others; their aim was in the first place, to procure a proper liquid; in the next, to fix two invariable points to reckon from, whence to establish a proper division. Mercury,

after various experiments, was found to be a proper fluid, and the freezing point, or 32 degrees, as the most proper to measure from; both of which are still continued as the best standard of judgment.

The mercury has its residence in a globular receiver, at the foot of a glass cylinder carefully graduated, so as when affected by the air, or plunged into any liquid, or other body capable of receiving it, the true measure of heat is thereby known; as the freezing point is settled at 32 degrees, so is the highest of heat in the air in this climate for any continuance found to be at sixty degrees; and whatever appears to be above or below these several degrees of cold and heat, are esteemed as approaching to extremes.

In respect to use of this instrument in the brewery, or other mixt bodies, ebullition or boiling is found to be the highest extreme of heat that may be acquired, and is 212 degrees on the same scale.

In the forming of extracts from malt, hops and water, the heat of the respective bodies are distinctly considered,

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as well as when united; the water is usually, before the application of fire, supposed to be of the same heat as the air in the shade; and that heat afterwards increased in the copper, to such a height, as suited to the heat of the malt, that so the extract may with more facility be completed; but as the heats of the malts are various, according to the mode of drying, so the heat to be apportioned can only be known by this instrument, or to what degree the water ought to be heated. In the best season for brewing the air is at 40 degrees, if malt is heated to the same degree; and it is requisite, that the whole heat of the extract should be 135, then will remain 55 degrees for the heat of the water; to ascertain this, the instrument is first tried in the shade for the heat of the air, next in the body of the malt in heap, and lastly, plunged into the heated water, and the several degrees therefrom obtained added together to complete the experiment.

The first thing is then to know, what heat you would have in the whole, or in the separate parts; and this according to what kind of drink you would,

and for what time of keeping, whether you would have the malt forced, or only a clean extract; all which essentially depend on the well calculating the requisite degree of heat.

The thermometer recommended as the best, is said to be formed on the projection of Farenheit; but as this has been long conceived, I may suppose the like fashion is every where attended to, and no great difficulty in providing the right at any instrument-makers in London.

A certain writer recommends the same sort as improved by Mr. Bird; his reasons are, "that it is scarcely possible any glass cylinder, so very small, should be perfectly regular, the quicksilver during the expansion, passing through some part of the tube wider than others, the degrees will be shorter in the one case, and longer in the other; if the divisions therefore are made equal between the boiling and the freezing points, a thermometer, consisting of such a tube, cannot be true; to rectify this, Mr. Bird put into the tube an inch of mercury, and measuring with his compasses the exact length of this body
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of quicksilver in one place, he removes it from one end to the other carefully, observing in the several places, how much it increases or diminishes in length, and thereby ascertain where, and how much, the degrees are to be varied; and by this contrivance his thermometers are perfectly accurate. And I think Mr. Bird has done very well, and set good example to the trade; and the only question is on this head, whether it is impossible to blow these tubes true, or as nearly true as any art can rectify them to; but this is left to other kind of artists to determine; as they may some way be had true, their utility appears obvious in the brewery, and may at the same time answer various useful purposes, they not only merit the attention of every gentleman, but likewise of every brewer, who may have pleasure in the excellence of his liquors, and may be the means in due time of forming malt liquors into a staple commodity.

I do not think it a matter of mere curiosity, to be informed by the thermometer of the strength of the wort, if it was only considered as a general proof of the condition of the malt and

hops employed; from whence, by various experiments, to form a true judgment of what kind of ingredients are best or turn to most account, as none will presume, that beer shall be of the same strength from the like quantity of malt and hops of every kind of growth, and drying, tho' extracted, and worked by the same rule, as they will certainly prove essentially different.

The rule is said to be, that worts are hotter than water in the like state, as in ebullition, which is a fixt point, and what difference there is between them, is the value of the strength of the wort.

If then I have my choice of four different kind of malts and hops, formed into worts in exactly the same manner, whatever each of these exceed 212 degrees, the heat of boiling water sufficiently proves the different value of the respective ingredients: tho' it may be objected, that some malts require a higher degree of heat to the extract; but even this seems to be in doubt, as, before the use of the thermometer, all kinds of malts were extracted by the same degree of heat; and however the
brewers

bréwers may have varied this mode, to force the mash for profit, it concerns not the gentleman to act otherwise than before.

The experiment may be made by very small quantities, without the hazard of much expence; and if the power of the wort be only the point in view, the best judgment imaginable may, by this experiment, be made of the goodness of both malt and hop.

As to any doubt, whether the thermometer may be used in boiling liquor, that is to say, whether the tube will stand that heat without flying in the violence of ebullition, it matters not much; for if it can be proved by the same instrument, that water boils at 212 degrees, the like proof may be made at what sum wort boils, the mode of proof being the same in both cases, or neither any proof at all.

But suppose a certain space of time be given, below the boiling point, both as to the water, and as to the wort; that is to say, if ebullition first took place as a fixed point, the fire then damped, and a few minutes space allowed to experiment the quantity of degrees on the

thermometer, in the water, and in the wort, if then the space of time after ebullition was given equal to both, would not the proof be the same, as if given at the boiling point?

I know not how far this may seem a curious enquiry, or merely so, but surely something may be deduced essentially contributing to the more thorough understanding of this art; and I should think one farther experiment extremely necessary; as thus;

If a single extract be made from four bushels of malt, for table beer, and the like from eight bushels to the hoghead, for strong beer, the extract made in the like space of time, from the same malts and like heat of water, and mashed in the same manner, and these severally experimented as above, at a heat the thermometer would bear; this would give us an ample idea in what manner for the future to prove the strength of different worts, and at the same time the value of the malt, when purposely varied, as likewise the strength of the hop, produced in a certain quantity from the like mode of extract, by decoction from two and from four pound of hops, in the

the different malt extracts, and added to the worts in the boil, after proving the strength of each respective wort; whence will be known what addition such, and in proportion any quantity of the like malt extract, will give to the strength of the wort.

Again, by the like mode of management, the strength of the hop may be separately found, the given heat being determined from decoctions of the like value, extracted in the same space of time from the like given quantity; so if one pound only of different samples be proved the same way, the goodness of the respective samples must be necessarily known; but as to flavor, that can only be known by the palate, and thence a judgment made how to suit different beers, and when to give the preference to the balsamic, and when to the coarser extracts, and the application be accordingly suited.

I am the more fond of this theory, as I could never yet discover any certain method to judge of the value of malt or hop, though various rules have been given for that purpose; no doubt experience may do much, but certain rules, readily applied,

applied, gives that knowledge to the unpracticed, which experience cannot without them obtain; the use of our senses, as to seeing, feeling, smelling, in the first instance, are not sure guides to an eventual proof, the artifice of sophistication, or giving a false similitude to all kind of drugs and vegetables, is now but too well understood, not to deceive the most practiced, in which light it seems evident, that the last proof is best made first, as that gives to the most practiced double experience.

It has been mentioned before, that experiments of this kind may as well be tried by a small as a large quantity of different liquids; to which it may be objected, that as to point of time, large and small quantities will not retain the same degree of heat, which in general is very true; but if an experiment kettle be set in the same manner as the brewing copper, it will, on the fire being damped, retain, for a certain space of time, as much heat as a large copper; and as only five minutes may be necessary, there cannot be any material error.

MAXIMS

MAXIMS *deduced from Theory and Practice.*

MALTS are to be selected, not so much from their beauty and appearance, as from their soundness and quality, and as adapted to the purpose for which they may be intended, the distinct color of the liquor, and the time for coming round.

Well malted corn will always be hard, sound, fresh and sweet, to have neither taste nor smell of fire, earth or water; the flavor grateful to every nose, and the taste pleasant to every palate.

Plumpness of grain is not always the best sign of its virtue, as sometimes moisture is the sole cause; but if with such plumpness it is hard and firm throughout, and bright and clear within, it will yield the more powerful extract. Spanish grain is harder and thinner than the English, but yields a much finer flour, and more in proportion; it is raised in a drier soil, and has a thinner skin, so will weigh more bushel for bushel; and this assiduously to be attended to in the choice of our grain for malting, if curious in the effect, or in estimating the profit.

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The *hop* must ever be suited to the kind of malt we propose to use, and the purpose we pursue in using it, whether it respects fancy, health or profit, as taste, general or particular, is not so much governed by intrinsic virtue as by habit, the being accustomed to, or that kind of flavor. In Germany, where fine oils seldom arrive, the goodness is estimated by what we call the badness of the commodity; and in Greenland, train oil is in higher esteem than sack; it is somewhat the same with our malt liquors in different parts of England; and our brown beer brewed in London, unless in a state of perfection very rare to be met with, but ill relished by those in different parts of the kingdom, who are either used to coarser, softer, or more delicate extracts; and as it is to the hop that we chiefly owe our notion of taste, the species is to be carefully adapted to that kind of taste, to which those for whom the liquor is prepared have been most accustomed, otherwise, however fine, will be but ill relished.

This, however odd it may seem, is universally true; and though it be well known that we have much finer bitters
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than hop, yet to those habited to some one species of that vegetable, the other bitters would be for the present, until use had wedded them to a new relish, very disagreeable. We see it here significantly in the taste of those who are fond of mild London porter, the bitter of which, to any other taste, is really nauseous.

In the use of water in the brewery, another consideration takes place, as it matters little to those who brew for profit, what kind of water they use, so it be soft. Water in general has no taste, nor will, like artificial compounds, change its taste, by a various stimulus of food on the palate; so that only two considerations take place in respect to that element, that which will best contribute, by its simplicity and transparency, to make the finest, and that which by its softness will draw most strength from the malt, and make the coarser liquor; it follows, that the rule in such case must be to adapt the water to the intent, or be satisfied with such kind of drink as this or that kind of water, with suitable malt and hops, will produce, it being equally vain to attempt the making of
fine

fine beer with muddy water, high dried malt, and bad or over-boiled hops, as to make a heavy beer, with transparent water, pale malt, and prime decoction of the rich hop.

In the making of all malt extracts, no doubt the degree of heat is primarily to be considered; but let this be ever so well known, the application must be singularly regarded, so as to be experimentally informed, how much extract may be made from any given quantity of malt, without prejudice to the drink.

In respect of profit, this not so much regards the brewer, as how much may be forced from the grain, good, bad, or indifferent: if then the gentleman pursues the brewer's plan, his knowledge of acquisition may be soon obtained: but if his view be a fine drink, his enquiry must tend only to know how much of what is sweet, pleasant and wholesome, may be drawn from any given quantity of malt of the kind he is accustomed to use.

The way to be well informed, is by making three distinct extracts from the same quantity of malt, pursuing the like farther process with all, and cleansing them

them into separate casks, and then, however one part may be stronger than the other, his palate will soon inform him of the distinction, and what would have been the effect, if one or both of the successive extracts had been thrown together; and the same in three distinct brewings, from the like malt in quantity and quality, of one, two, or three extracts; but this demands more time and expence.

An experiment of something of the like kind respects the hop: the business of profit is to get all out, of health to get all out that is good, and to be thoroughly informed how to separate the good from the evil qualities, is by three gradual decoctions, in equal spaces of time; and these several extracts, after experimenting the distinction, gradually commixed, from whence a judgment very readily made, of the effect, each separate or together, would have on the taste and even quality of malt liquor; and at last it may be a very sober question, whether at any time hop ought to be put in the boil? as it is certainly one cause, why much yeast is requisite in the future fermentation; and this is the
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more to be regarded, as in the first place, the hop cannot be requisite in the boil; and in the last place, some of its finest qualities must then evaporate, and the coarse oils remaining as well contribute to cloud the beer, as to impede future ferment.

I take it for granted, that acids will thin the worts: it proves so in the event, when the strongest chymicals are used for that very purpose to be had; and why not in the first instance, as it is certainly better to prevent a disease than provide a remedy? This I confess is mere theory, and I wish it may appear on the other side, that the whole process now in vogue is not big with absurdity. We know that acids only in this case procure a ferment; it is admitted by the use of yeast an acid of the worst kind, and afterwards of oil of vitriol, and even aqua fortis, are often found necessary; yet will the brewers apply, in the very first instance, a subject of a quite different quality, and the worst part of that subject: as thus, they will boil the hop in the wort, to increase the quantum of coarse oils, to separate or break them, they will use yeast; and after all, when the
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beer turns cloudy; they wonder how it happened.

The comminution of parts wanted in the boil, and in the future ferment, is of the oils and salts produced from the malt extract: to effect this, they evaporate what should procure that comminution, and add more coarse oils by the hop.

Can there be any doubt, that if an extract from the hop, or, if they please, even the gross hop, was put into the cask, after cleansing off, the liquor would not preserve it as long and as well as if tortured in the boil? Experience has evinced much better, with this singular advantage, that it would prevent a future untimely ferment in the cask.

By this mode of management, it will likewise be more certainly known what hop was necessary, as after the last ferment in the cask, it would plainly appear, by the course of the different ferments, what of the hop quality was more particularly requisite to correct any superabundant acid in the wort, if such, on the depression of any violent ferment, remained.

That in the event the acids would become prevalent, without the aid of the hop,

hop, or some like substitute, I have no doubt, and in such case staleness ensues, but cloudy beer never.

Stubborn beers are evidently the effect of superabundant oils, and such earthy qualities, as violent extracts force from the mash, and from the hop tortured in the boil, increased and established by evaporation of those fine fluids, which should preserve natural mediocrity.

This is proved more ways than one, by the superfluous oils floating in the body of the drink, as with a proper glass we see animalcula floating in the air, and by the established practice of manufacturing fine beers, where no such oils are apparent, consequent of the malt being more slack dried, the wort less boiled, and the hop less tortured.

Brown malts and brown hops therefore require more care in every part of the process; that is to say, should be less forced in the first instance than pale bright goods; as also less boiled, as the oils are thicker and coarser, and should be as little as possible severed by evaporation from the acid salts; but practice is the very reverse, upon a presumption that much boiling produces a happy commixture,

commixture, and so with moderate boiling, without the hop, would probably happen; but if the wort, before boiling, be overburthened with coarse oils, as seems to be the case, the addition of what is drawn from the hop can never be presumed to lessen the evil; nor does it appear, how far boiling contributes to thin the oils, other than as supposed to open the bodies, and free the inherent vivid spirit; which taking wing, the wort gradually forms itself into a closer consistence; and as the boil continues, becomes a kind of salve, and I believe a very good one for many purposes; and although boiling is not carried to that excess, we may reasonably deduce an effect not very agreeable, though moved through but part of its progress, as we see it turns to an impure liquid often incurable by human art.

The sum of all our theory, and of all our practice, centers in this, that whatever grain we use for the brewery, should be from sweet land, sound and healthy, the malt made from it dried slow and slack, the extracts made from it not too much forced, the boil moderate, the fermentation brisk but equal, if possible without

without yeast; and when the ferment ceases, then to apply the extract of the hop, unless it happens, as may be the case in some seasons, when the air is over-heated, that the ferment proves too violent, for the moderating of such ferment, apply the hop.

○ If beer be fermented in the wort tun, it is neither necessary nor proper to ferment again in the cask. It is urged in practice, that the wort in casking will be flat, and therefore needs a fresh ferment: it may be so; but as it is likewise the practice to fill butts of beer with the flat liquor, from time to time thrown into the tap-tub, and that beer never failing to come round again in a very moderate space of time, so as to be in common draught, it must seem strange, if fresh brewed beer would not take the same course much earlier, the ceasing of the ferment being only a temporary allay of the spirituous parts, which must certainly revive again, and often with too much vigor and agitation, and then the fine hop extract is a sure remedy.

○ It is the same when beer is to be bottled: it is by all prudent managers then purposely

purposely left open to become flat, but revives again sufficiently in the bottle.

The truth is, that flat beer, whose spirit is not evaporated by time through the pores of the cask, is in a mere state of quiescence, until roused again by the action and re-action of the internal and external air, closed up together with the drink in cask or bottle, and in time resumes a briskness but little below fermentation. Such as are in haste to bring this about apply loaf-sugar, which certainly effects it. Patience will have the like effect; but here it must be observed, that high boiled beers imbibe less air, and are always longer in coming round, and the spirit at last extends itself no farther than to produce a thin cream, or smile on the surface, the only happy quality I know in high boiled beers.

The composition of water, salts and oils, in the ordinary course of management, assume their different periods: if an alkalous quality proves predominant, in proportion to its strength, the time of keeping may be nearly adjusted. If the salts and oils are so duly balanced, as to produce an equal taste, the drink

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will come round in about six weeks, and if the acids prevail in about a fortnight, if no fresh ferment ensues in the cask.

These maxims are to be understood of the temperate seasons, as no regular judgment can be made of their course, when the heat of the air is above sixty, or below thirty-two degrees, on the scale of the thermometer.

If worts are neither boiled nor fermented, they will generally remain in a quiescent state, they will act on the body only like honey and water mingled cold, and have no effect on the brain, but if a spontaneous ferment ensues, they will then acquire strength, and operate in the same manner, as if the whole process had been pursued, but not quite so heady and intoxicating as if fermented with yeast, and still less, as when yeast is beat into the wort.

Acids are the most light fluid body, and most apt to receive the external air, by attraction or similarity, than alkalis, and therefore best adapted to procure fermentation, which the quiescent state of unctuous bitters utterly resist. Yeast is an open spongy body, that attracts, similarises,

similarises, and retains the external air; but being mixed with coarse oils, is, without great care in management, apt to contaminate the drink.

Vinos acids will, when well adapted, produce the like effect as yeast, as to the ferment, but will rather improve the relish than contaminate the liquor: oils they have immixed, but they are too highly matured to produce any bad effect; they are rather sweetly balsamic, than entertaining any nauseous quality.

When beers take an untimely ferment in the cask, it is either owing to the season; the bad state of the cask or cellarage, to the internal air that wants vent, or that the external air enters in too large a quantity, and sometimes of all together. The remedy is fresh hop, or the balsamic decoction. Beers in that state will not force the fresh hops in boiling, nor will it operate so quick on the untimely ferment as the balsamic decoction.

All ferments after cleansing ought to be prevented, as it works off the finer spirit of the drink. This is commonly apparent in cyders prest from immature fruits, and if not timely prevented, turns

them into vinegar : so it will happen in beers, though not so suddenly. The remedy for cyders is brandy ; the same will do for beers ; but if not well considered, produces a flatness.

If beer be cleansed into wine casks, as generally best, the bitter should be something the predominant quality, though intended to come round early, because of the acid in such cask contained.

The beauty of cellarage consists in an equal degree of heat and perpetual dryness, both as it respects the preservation of the cask, and timely mellowing of the beer, it being observed, that vaults cool in summer are warm in winter : high heats set beer on the fret, and sharp cold coagulates the oils, and makes the drinks appear foul, as the heat opens the body of the oils, and sets the salts afloat : hence it should seem, that constantly preserving a due mediocrity of the heat of the air in all seasons, must be the truest means of having well brewed beers always in perfection, which is no mean advantage in great families, though it signifies little to those who brew only from season to season.

season, or to the common brewers, who regulate their store by the custom they have forced, or that would occasionally force the drinks to come round, much earlier than at first intended, by giving free entrance to the external air, and other practices. In great families, they have usually good vaults, the effect of nature or of art; but middling families are most commonly defective in this particular, and yet can afford to keep a stock of beer.

Vaults are not good under streets or open yards, as in one case the passage of carriages shakes the earth and disturbs the beer; and in the other, wet oozes through the crown of the arches, and damps the cellars.

In the common cellarage under the house, the beers are often disturbed by the electrical fires in stormy weather, and other shakings; which is not the case in well constructed vaults in the like situation. An absolute remedy for this is not practicable. Cold may be in part kept out by horse-dung closing up the apertures; and I conceive the same will guard against heated air; so may it in some measure be equalised by

a ventilator, into what state we please of coolness, and at the same time the vicious air extracted so in winter by the use of stoves brought to a similar medium; but good vaults much the best effect of art, and, in the ordinary course of time, much the cheapest.

In cellars raised and thatched after the manner of our ice-houses, and the foundation laid six feet below the surface, and in a dry soil, may probably make the best cellars in the country at less expence than arched vaults, as neither heat or cold have any effect on the internal parts of such structures, as thatch, well laid on, has always been found the most of any thing impenetrable to air.

When beer is come round fine, the time of tapping it should not be omitted, because if it takes a fret, it will rarely recover its natural fineness again.

Fine beers that come round early, need not curious cellarage; it is sufficient they are kept dry, and out of the weather: but in curious vaults, they will be longer coming round, and keep better, after being tapped in a long draught.

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All beers are in a better condition to bottle after being flat in the draught, than when first tapped.

Low fermented fine beers in the bottle require being kept cool ; high fermented brown beers moderately warm ; the one has internal air enough in the body to rouse the spirit ; the other may want some aid from the external air.

In whatever cellars beers are, they should, if possible, be so placed, as not to need a removal, as that will throw the lees into the liquor, give it a bad taste, and make precipitation absolutely necessary ; and in pale beers flatness generally ensues.

As the oils, in the extracts from pale malts, seldom overbalance the salts, there is not generally any need of precipitation ; but if, by the extract being too violently heated, or by the hop being boiled in the gross, the oils should prevail, and not be sufficiently attenuated in the consequent ferment, in such case, isinglass dissolved in stale beer, or the same dissolved in the liquor from the cask, beat up with white of eggs, and strained through a fine sieve, will be the best method of fining down.—

The white of twelve eggs to one gallon of dissolved isinglass.

Beers brewed from brown malts will always need precipitation or time; the latter hazards something worse than foulness, and the former very precarious, especially if the color be very high, the hop high in quantity, gross in kind, and much boiled; in such case no finings at present known, will at all times so attenuate, as to produce transparency; therefore is the color of the malt, the kind and quantity of the hop, and the time of boiling, to be carefully attended to, if a bright beer be proposed.

Oils do not only float on the surface, but are disposed through the whole body of the liquor, when opake or cloudy, and are only to be recovered by acid fruits, external air, and loaf-sugar.

All ferment produces attenuation, but attenuation may be carried so far, as to make beer worse than cloudy.

Beers turning to a harsh sourness, are not to be recovered by testaceous powders, salt of wormwood, or lime, nor will they make good vinegar, without passing through a fresh fermentation. There is no remedy so good as the hop,
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and that only partial; but if, upon an equal taste being produced, it be immediately bottled off, it may prove tolerable; and that is the most that can be expected: and as in this case a flatness must necessarily ensue, it must be quickened by time, loaf-sugar or raisins, in proportion as expected to come round.

Molassus gives at once both strength and flavor to beer, and is no otherwise obnoxious, than that the law forbids common brewers its use, in favor of the malt-duty; but when it is used, as it may, to recover sour beer, the penal laws seem not to affect it.

The berries of *Coculus Indicus* will bring low beers, produced from long extracts, to a degree of strength that common drinkers are very fond of; but if they are not pernicious, they are much questioned, and no wise man will use them for his own family. Such, or any other ingredients, than malt, hops, fruit acids, or dried grapes, are an improper mixture; and when the malt and hops are really fine, and not too forced in the extract or boil, fine beer will always be produced by them alone.

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When oils meet with the grist negligently emitted from the mash-tun, they unite and entangle the salts, in the common order of device, past separation; the liquor then is in much the same state as water-gruel will be, when the oat-meal is injudiciously attempted to mingle in hot water; it runs into clots, that are not easily severed again. If the grists so emitted be harsh and coarse, they will form themselves into lesser bodies, and float about the whole substance of the liquor; but if of a finer grist, they will gather into larger consistencies, and in time precipitate with their own weight. Air will essentially contribute to this, as it will gradually concrete these floating particles, and assist their descent; but it is possible, that before this happens, the strength of the drink may be exhausted. How far soap- lees may contribute to dissipate this cloud, or in what quantity they may be safely applied, experiment can only determine. I am fully persuaded, that no ferment will act to any purpose, that will not totally destroy the liquor, by emitting both body and spirit. Prevention is in every man's power in the first

first instance, by avoiding a too powerful mashing, by letting the mash rest a due time, and by letting down the extract through more than one strainer, so that the liquor may run off pure and transparent.

It is a known truth, that unctious bodies will not, by any power, so mix with acids, as to produce one uniform taste, until so thinned by fermenting in other liquids, and the acids so formed by the same means, as to meet in one common quality. This gives us a reason for the necessity of fermentation, in order to the procuring an even taste to these kind of compounds.

Grains of Paradise will give a particular flavor to beer; but it rarely happens, that any flavor, so obtained, will please, but where habit has given it a relish.

Fermented liquors, in a lively condition, are never at rest; the great ferment sets all the parts in motion, and the lesser agitation continues it; and if that seems inclined to fail, it must be revived by art, or the drink becomes flat or sour.

To know the art of managing beers after casking, is at least as requisite, as

skill in the previous process: the want of understanding this, is the true cause why they seldom come round happily, or are preserved throughout in equal taste and flavor, though ever so well manufactured: for which reason these aphorisms have been formed, that every gentleman who esteems malt liquors, may be himself a good brewer.

A SUMMARY of the Principal Matter contained in the preceding Sections.

Mr. Combrune has very well observed, that if a proper liquid was used in the steeping of barley for malt, as lime-water, or such like, it might contribute to the purity and perfection of malt liquors: from whence may be concluded, that fine acids are more wanted than oils to the attainment of such perfection.

There may, however, be bad acids, as well as bad oils, such as will not, at least in the ordinary course of management, assimilate with the finer, and are what have a bad effect on the palate; but if such could by any means be thrown off in the barley steep, the less difficulty there would be in the management of the future process.

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The throwing off the groffer parts of sugar by the power of lime, seems not to be a parallel, as that gentleman is pleased to think, as in one case it operates on a solid, and on the other as a fluid body; but it is a good hint, as it respects precipitation in fluids, and in that light has been mentioned before, particularly in respect to foreign wines.

The Spaniards use it as a precipitant, as well as to stop violent fermentation, especially in their dry mountains, which are usually brought down to the maritime coasts in skins, and much disturbed in the journey.

A distinction must here be made, that at first sight may seem inapparent: it is, that lime so used in the wines abroad, and here as a precipitant to sugar, is not made from chalk, but from stone of quite another nature: our sugar-bakers use that made from the blue Maidstone stone, and has double the power of chalk, both as to heat and strength of cement. In Spain, it is casual from what stone, but never from chalk; and the Italians chiefly make their lime from marble: nor, in my opinion, will chalk-lime ever act properly

perly in any of the cases pre-mentioned, as being replete with gross oils, and therefore extremely inapt; for although chalk, in its natural state, is very well considered in water for brewing, it is not to be considered in the same light for precipitation, after being fired into lime, nor for the extracting or destroying of bad qualities in the barley steeping; and is merely mentioned here, to prevent an indistinction in the use of the word Lime.

The philosophy of brewing is no way so well understood, as by practically considering the several ingredients, distinct and united, as bodies of a different nature or quality in their separate state; by being judiciously embodied, become neutrals, as is intended in all kind of well considered composition.

Malt liquors may be formed from the grain, and water, which is a mere menstruum only, and the grain so extracted will probably remain in a quiescent state some time, flat, sweet, and mawkish, but will not be in any sense the liquor in view, or calculated for the cask or the cellar, indisposed to pleasure at home, and inutile as to emission abroad;

abroad; therefore are its oils broke and thinned by fermentation, its spirit awakened and set afloat, and its acids corrected by the hop; so that when brought to one body in taste and quality, it loses all its distinct powers, and is then that liquor we call Beer, reduced by art to the like quality, as if the mere effect of a simple extract, as wine from the grape.

When this is not effected, the art and mystery of brewing is not well understood: this however must relate to the future, as well as the present; and to make a good judgment of time, extremely material, as the corrective quality of the hop must be superior for the present, if intended for time, otherwise it is merely ale, and may be formed with little corrective; but to judge well of the application of correctives, so as to come round into an equal taste in the time proposed, is, as to this branch of management, a material consideration; but even this must be attended with a thorough knowledge of the qualities of the respective ingredients, so as not any extracts or decoctions be made but of the better qualities,

ties, otherwise, though the liquor be preserved the appointed time, the taste and flavor may be utterly ruined, as will always happen in violent extracts, especially from high dried malts, and overheated hops: the correctives to these, if any can be, are the acid juices of vinous fruits, the grape or currant; such, in a fresh ferment, will in some measure remedy a bad taste, but it is best never acquired.

Forward beers, inclinable to acidity, will, when bottled, continue in much the same state as in the cask, without any assistance; and the same of backward beer bottled too early; the bottles give the one no other alteration, than as the air acts upon them in the time of bottling, and should be closed presently; the other, if left open a time, may acquire some acidity, to give them a forwardness, but not to any material purpose: so that the first consideration is the best to make a near guess of the proper time for bottling; but as this may be readily conceived by pegging, the only difficulty then is, so to calculate time, as that they may not come round too soon, or too late for convenience,

as it answers no proper end to have it before, or after it be wanted.

It is undoubtedly true, that both in boiling and future fermentation, the finer spirits evaporate, and supposed that amends may be made by attenuation of the grosser parts, a kind of substitution that is very hazardous and uncertain, especially as to taste and flavor, it may even improve in strength, and I am apprehensive, has some respect to health, as the lighter fluids are the most salutary.

It is universally admitted, that there are both gross and pernicious qualities resident in both malt and hops, and how far such are capable of being attenuated, is not all the question, as how far they may become salutary when so attenuated, supposing that may be fully effected. Nature operates more gradually, and to much better purpose, than culinary fire; the salts and oils of vegetables are thinned, purified and refined, in a very different manner by the sunbeams, than human art has any acquaintance with; and where nature operates highly, as in hot countries, we find common metallics matured into gold, and every where fruits and vegetables

vegetables exalted in taste and flavor, in proportion as favored with the sun's propitious power: therefore, to first throw off the fine qualities of the vegetables we use in brewing, and attempt, by a violent attenuation of the residue, seems as inconsistent with our natural skill and powers, as to turn alchymists, and transmute base metals into gold.

If this were not evident in the brewery, as well as to common sense, it would be sufficiently apparent in the distillery, where the grain is forced to a higher degree than in the brewery. Here is the highest experiment made, whether coarse oils can by violence be tortured into any degree of purity; and though they attempt to keep as much of the fine spirit in as possible, they produce nothing at last but a foetid extract. Some have attempted to rectify with chymical acids, and some have been wise enough to use vinos fluids to attenuate the gross oils: had the latter taken place to a proper degree, the spirit would have nearly resembled that extracted from fermented wines; nor should I think them wrong, if in such case they worked by compression, as
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preserving the fine spirit from flying off, is of much more consequence than admission of the external air, and the oils sooner maturated into some degree of fineness, though not of the kind which are gradually formed in the common order of nature. Hence a slow procedure seems requisite; but how that may operate to present advantage, is not so readily determined.

It is generally agreed, that the best spirits are drawn from the smallest wines, and gives us a sensible distinction between the French and Spanish brandies; the latter draw more from the like quantity, but at the same time proportionally less in value. I have drawn a very fine spirit from our own fruits, that I think at least equal to the best French in taste and flavor; but how far plantations for the like purpose would answer here in respect to profit, is only at present to be guessed: these are, however, hints sufficient both to the brewer and distiller, so to improve their respective products, as to strike out some new mode of manufacturing malt, so as to furnish out a staple commodity more universally saleable; and this to be the more reasonably

ably considered, as that neither hot nor cold climes can produce the like, and consequently the higher probability of success; but what may not concern profit, may be essential to health; and what may not be the business of the brewer, may be the happiness of a private family.

In this light it is, that I beg leave to recommend it to serious reflection, whether, as it is agreed that coarse oils are extracted both from malt and hop, that it would not be nearer the maturation of nature, and to bring such to some degree of purity, rather by a gradual heat permanently even, than by sudden violence?

I am sensible it requires both time and attention; but to imagine, that even the grossest oils would not exalt by a moderate continued heat, rather seems the effect of impatience than judgment. I am likewise sensible, that some learned chymists suppose the requisite heat to be between 94 and 212 degrees, on the thermometer, gradually increased; that this mode will exalt the oils, I am in no doubt, but what is the event? Why truly, that the finer parts take wing as fast

fast as they become fine, and the grosser either not properly exalted, or vanished.

The manner of making vinegar intimates something to the present purpose. Fermentation is in this case carried to an extreme, and the oils not previously exalted, precipitate; hence the acid quality prevails, and only so much of the finer parts remain as contribute to the body or strength of the liquor, whence it avoids freezing when oleaginous bodies are congealed. Vinegar then is only fermentation carried too high for drinkable liquors, and evinces, that such liquors should not be too highly fermented. Acid fruits and sugars, not so highly fermented, operate to the like effect, and produce the finest vinegars. Nature has previously attenuated the gross oils, so that they either become wine or vinegar, as the oils are more or less attenuated by art: hence we deduce the medium in view, both in respect to body, taste and flavor, which are all in some measure destroyed, and in some measure preserved in vinegar. From these various modifications, we see deduced the purpose of the several extracts made from malt; that superabundant

oils

oils produce cloudy beers; a regular and slow commixture of oils and salts, a proper liquor, pure and transparent for the table; and from a forced fermentation, vinegar.

All distillations emit the lighter, and retain the heavier parts of the malt, and consequently consists more of the acid salts, than of the oils or earthy parts: hence it may be readily conceived, that the spirit is more in the salts than in the oils; but this is so light and volatile a spirit, as not, without being entangled with the oils, to be retained in beers; but such oils should not be so predominant, as to impede the operation of the spirit, which gives it a vivid countenance, nor so gross, as to destroy the taste and flavor.

The same cause that affects the taste and flavor of beer, will operate, in some measure, on distilled and high fermented extracts, on the brandies and vinegars; and all tortured malt and hops will produce that effect, whether from the kiln, the extract, or the boil, or from all together. Hence neither good brandies or fine vinegar, any more than pure beer, is to be expected from contaminated fluids;

fluids; so that however the oils, happily exalted, may be extremely requisite in either case, yet the forcing out of such as are too immature to blend in the liquor, will ever be fatal.

I am apprehensive, from these, and various preceding remarks, that could an extract be made from fine malt, by an equal degree of heat, like that of the Mary Bath, and regulated by experiment and taste, to a fixed share of time, as in such case neither the spirit would evaporate, nor foetid oils extracted, that beers might be produced of quite another nature than any at present in use, more vinct, pleasant, and salutary.

It is very true, that in the present mode of management, the boiling of malt liquors contributes to their preservation, and so it does to their bad qualities; but if the same may be done in respect to the former, and the latter be avoided, it must certainly be better, and why the best part of the hop may not have the desired effect, as the bad part of the malt, seems not a very difficult point to be resolved.

Worts so extracted, would necessarily pass through a natural ferment, and the salts

salts and fine oils more readily mix, and an equal taste be produced by a very calm and moderate effervescence, there not being any necessity to draw the external air in aid, when the internal has never been evaporated; and it only then remains to avoid all hazard of cloudiness, that the extract be perfectly settled, before strained off into the wort-tun.

This would at the same time save half the expence now laid out in the brew-house, half the labor, and much of the hazard occurring by the present mode of process: beers would then be almost as easily made as wines, and perhaps nearly as good too, at least by the aid of some hints pre-mentioned, be entirely freed from that scorbutic quality they now so eminently possess, and be in some measure, as wines are, rather a remedy than a disease. But as that which appears sometimes evident to reason and common sense, may not be found true in experiment, it may not be amiss here to give some instances of the like way of thinking reduced to practice, as is the case in some families, though not exactly after the mode above prescribed, but

but seem founded on the like sentiments of not torturing either malt or hops in the boil.

The mode of process with some, is to heat the water up to within twelve degrees of ebullition, and in that state run it gradually off to the malt, until a sufficient supply be given for the quantity intended, mashed as the liquor comes down, and stands for settling two hours: the hop is then put into the receiver, and the extract let down upon it; and after two hours infusion, it is returned to the copper, and heated up to the like degree as before; thence is let down into the back to cool, then cleansed into, and fermented in the cask.

This is, as to the main purpose, what may be desired, but is not the thing proposed, as the process seems in many respects precarious, as the first heat may set the malt, and the uncertain state of that heat not accounted for; as it is the opinion of the skilful in this art, that by too strong heats, more oils are thrown into the mash than can be converted into spirits, and fermentation by that means clogged and impeded: if this be true in the distillery, it is equally the same in

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the brewery, and corresponds with what has been previously hinted: however, as the liquor produced in the said mode of process has generally proved very good, the setting of the finer parts of the malt has not perhaps occurred to observation, as not very apparent where the malt has been coarse ground, as it is the flower only that sets with too bold a heat.

This practice, or something like it, is not uncommon in many parts of England; that is, neither to boil the water nor the wort, nor to ferment in the tun, but in the cask only: but the same persons have not generally the patience to let the drink take its natural course into ferment, without the application of yeast, or such like improper powers; so that their drinks may be passably good, but far from being perfect; it being an established truth, that if extracts are not overpowered with oils, there can be no necessity for an artificial ferment, nor will ever be overpowered with oils, unless violently forced in the extract.

Tea is a more delicate vegetable than any of which we treat, yet if it be forced in the extract, becomes extremely nauseous.

seous. The Chinese, for the market, forced it in the same manner as our brewers do malt and hops, and for the like reason, which is profit; but people of fortune and nice palate understand it better, both as it respects health and pleasure, as making but one simple extract: for this purpose it is best opened by the highest degree of heat, water is capable of receiving; it cannot set, as being all leaf, and no flour; what remains after the first extract is best liked by habit, as seeming stronger; but these are such as cannot, or will not afford to have a more delicate taste, and give themselves very little concern about either the salutary or insalutary effects.

Rhubarb is one other instance of the regard we ought to have in all kind of extracts, and has some similarity with the subject in question, especially that branch of it, the hop. The first extract made by decoction from rhubarb, in its prime state, is mild, balsamic and pleasant; the next rough and harsh; the taste inconceivably corroding and nauseous; when together immixed, seem merely calculated to stop fluxes, and that not without some danger of a worse event:

the two former extracts immixed, act as a kind of alterative, that neither bind nor purge; and the first extract alone operates as a pleasing, modest opener.

It is in some measure the same in the management of malt and hop extracts; the qualities of these are not in any part so high as in rhubarb, nor so low as in tea; but we always find high boiled beers from forced extracts of malt and hop, at any drinkable time, binding, and ales of lesser extracts opening.

There are many other instances to be given, why the immature qualities of vegetable products should never be forced into, or commixed with the more mature and spirited; but these, as above, being the most obvious and common, are, I hope, sufficient to satisfy any rational mind, what ought most to merit esteem, and be the object of practice.

EXTRACTS formed from native and exotic Ingredients, separate and immixed.

Extracts for the compounding of liquors in various countries, resembling beers, has been the custom of ages, and are introduced into this country at a very high price, with the duties annexed, when

when as good, or better, may be made at half value.

Malt liquors manufactured in England, with all their faults and defects, are vastly superior to any thing which the northern countries can produce, and the southern aim at nothing of the kind; but as wines come cheap where duties are low, our beers must do something more than excel, must be vinos and pleasant, as well as fine, strong, and powerful, or we must never presume to establish a manufacture for export of any consequence; and as this may not speedily be effected, wherever an import appears, that we can imitate or excel, reason and interest make it requisite that we should attempt it; and the first I would wish my countrymen to imitate and improve upon, is the Brunswic Mum, for which reason I have here-under given the original receipt, with such hints for improvement, as may probably tend to the common benefit.

BRUNSWIC MUM.

The original receipt is not here given in the order as prescribed in the record of the town-house of Brunswic, as that is very defective of instruction, in respect

to the process; but shall faithfully transmit the ingredients in the proportion directed. Sixty-three gallons of water is to be boiled, until one third be consumed. This quantity, so boiled, is to be let down, as I suppose, upon seven bushels of wheat-malt, one bushel of oat-meal, and the same of ground beans; and then, I suppose, for it does not appear, the extract is to be drawn off, or let down into the receiver; nor does it appear, whether it is to go into the copper again and be boiled, nor how, previous thereto, the mass is to be managed, or how prevented from running roapy, as the consistence is very thick: it is only said, that when it is runned, the hogthead must not be filled, and, as it seems, is only worked in the cask; and whether so spontaneous, or by art, is inapparent; but as soon as it begins to work, put into it three pounds of the inner rind of cit, one pound of the tops of fir and beach, three handfuls of *Carduus Benedictus*, a handful or two of the flowers of *rosafolis*; add burnet, betony, marjoram, avens, penny-royal, and wild thyme, of each a handful and a half; of elder flowers two handfuls, or more; seeds of *cardamum* bruised, thirty ounces; barberries

berries bruised, one ounce. Let the vessel work over as little as possible; and when finished, fill it up. Lastly, ten new laid eggs, unbroken, stop it up close, and drink it at two years end.

It is farther said, that our English brewers, instead of the inner rind of fir, use cardamum, ginger and saffras; and also add elecampane, madder and red Saunders.

MUM, on being imported, pays one pound-five shillings the barrel, which I suppose may be the same measure as is above called a hoghead, as it is impossible to extract what we call a hoghead from forty-two gallons of water remaining after evaporation in the boil, or even what we call a barrel of thirty-six gallons, as the malt proposed will absorb at least one third of the forty-two gallons, unevaporated; and then, until better informed in the measure, we can only act presumptively, and so make a hoghead of mum with so much water as will amply answer the purpose; nor can the extract be made from wheat-malt, unless unground, at 212 degrees the boiling point: nor is it easily conceived, how water so flattened in the boil

can produce a liquor of any kind of estimation or spirit, to keep two years.

The mystery of the ten unbroken eggs must remain a mystery, for any thing I can conjure about it: but as I have not any apprehension of their use whole, I have some of their being broken, as they would then soon rot and spoil the liquor: but perhaps, in the mode given, they may, in a gradual decay, feed and refine it.

If any one shall be curious enough to attempt the making of this liquor, as it is said some here do, perhaps it may turn out better, if the spirit of the water is not destroyed in the boil; and I am afraid, that if the wheat-malt be unground, yet that the boiling water will set the oat-meal and bean-flour in the mash, whence I presume that may not be involved until the mash be cool, or that they be separately mashed cool, and then immixed with the wheat extract. But this is all conjecture, and there I must leave it.

MELASSUS BEERS.

These are variously manufactured in different countries, according to the ingredients to be mixed in such countries produced.

produced. In England we only use melassus as malt, and add no other ingredient but hop, and that in a small quantity, as it is rather considered as a kind of vinos ale than beer for keeping, it being more wholesome than usually malt liquors are, and makes a pleasant summer drink.

The proportion is twelve pound of melassus to the barrel of water: the mixture is made with the water very little warmed, then boiled half an hour, to which add the extract from one pound of hop, and let it be fermented in the cask: this will be fit to bottle in about six week, or may then be drank from the cask; if it is not then fine, it may be thrown down with a small quantity of isinglass, but this seldom necessary, and only occasioned by the hop, and may probably answer better, if the *calamus aromaticus* be used instead of the hop.

In *Newfoundland* the mode of process is much the same, but instead of hopspruce, the tops of pine branches, or the buds, are customarily applied: many there, for certain reasons, do not take

to much trouble with it, but it answers accordingly.

In *Pensylvania* their mode of process is; to five pounds of melassus put half a pint of yeast, and a spoonful of powdered raw ginger: put these into a vessel, and pour on them two gallons of boiling water, and bar them well up, as we do, in a mash, till a fermentation ensues: to these add thirteen gallons of water lukewarm, let the liquor ferment twelve hours, or until the ferment ceases; then bottle it off, with a raisin or two in each bottle, taking care at the same time not to close the bottles too soon: it would do full as well, or perhaps better in the cask, if a quantity sufficient, and is so done with the better sort of people.

In *Carolina*, the pine tops from the turpentine tree are boiled until the rinds are loose; they are then stripped off, they strain the liquor, proportioned to such a quantity of water and melassus as intended for the brewing, and are used merely as an hop extract, but are an higher bitter: this composition is boiled about half an hour, and then set to cool; when lowered to a proper degree of heat, they slice into it a certain quantity of the
sweet

sweet or Spanish patata, which sets it a working: when the ferment is over, it stands some time to cool and settle, and then is cleansed into the cask, as in the brewery here.

When spruce can be obtained, the pine tops are rarely used, as being rather a disagreeable bitter, and not esteemed so wholesome as the spruce, which is scarce in a flat country, as it grows chiefly amongst the rocks.

The people of Carolina are now upon a new plan of brewery, by attempting to malt their rice; in which, if it does not answer to their wish in brewing, may succeed in distillery, as the best species of arrac being drawn from that grain, that of a lower quality is from the cocoa-tree, the wine of which is usually called toddy, extracted from it by tap in the like manner, as another vinos fluid is from our birch-tree. It is most probable they will not succeed in the rice brewery, because of the heat of the air in that climate apt alone to fox malt liquors, and give them a kind of empyreuma; but if it answers in the distillery, it will be an essential benefit to the colony, and therefore wish them to

set out wisely, as, according to the old adage, not to spoil a sheep for a half-pennyworth of tar; for if the extracted spirit will not answer their end without a too violent extraction, their labor will be in vain, as the making a bad commodity is worse than making none. Credit depends on the first attempt; and if that fails, it will be difficult afterwards to bring it in fashion.

These are the general foreign breweries, or attempts at brewing, as of some distant resemblance to malt liquors, or as proposed to answer the like purpose; after having gone through some remarks on the different seasons in this climate for brewing, from whence may be deduced some conjectures, whether it may be worth our while to attempt at excellence in these kind of foreign manufactures, as not having the materials at home, and transmitted hither so burthened with high duties. The melassus, no doubt, would contribute much; but, as is observed before, that may not be used in trade, and neither spruce nor fir of any avail without it; as, suppose either honey or sugar were to be used as substitutes,

tutes, I apprehend they would not in all respects answer the purpose ; or if they did, no sooner was such a manufacture to take place, but a high duty would be palmed upon it, even if requisite to our health, as something of a more vinos nature is really wanted to counterbalance the gross products from beers, as now brewed for the use of those, who cannot in any sense drink wine, and from whence more insalutary consequences ensue, than even the best physicians generally conceive. I have therefore, in the course of this work, as far as modesty would permit, attempted to strike out a new mode of brewery ; and that it may have something more of spirit and vigor to convince, I shall consider the state and nature of the seasons, according to the brewers own notion of the effect they respectively have on the present manner of brewing with the customary ingredients, and what effect must be necessarily produced, by giving a more vinos palate to their liquors, without offending the legislature.

The brewers say, that the two best seasons for brewing are March and October,

tober, or nearly about those times, or as the uncertain temperature of the air this climate happens to present. Their reason is, that in a colder season a proper fermentation may not be obtained, and in a warmer it operates too violent.

There is no doubt, that in the colder seasons the oils stagnate or thicken as the degree of cold may be; and that in the warmer, both oils and salts are more thin and spirited; and was this all the impediments to brewing, the remedy would be very obvious, and they might, as they generally do in London, brew at all seasons, but not equally well in the same mode; for if the oils are equally forced in winter, the extracts equally violent, it must be proportionally difficult to produce a proper ferment, because the salts being then entangled in the condensed oils, no vivid operation can ensue, but by another kind of violence of heat, to break such condensation, and give the lighter spirits means to act: hence springs an evident consequence, an addition of heat, and of yeast: but if in the extract was fewer oils, and more acid spirit, it would

would not be equally requisite either for more heat or yeast.

It is true, seasons may be so cold, that even acids may be bound up; but as that rarely happens in this climate, it is little to the purpose of this argument; and therefore, if less violence was used in the extract, or that supplied with a sufficient quantity of vinds acids, the drink would be equally powerful, if not more so; the fermentation would go on, as in more propitious seasons, and the pernicious quality of the yeast avoided.

That yeast is pernicious, themselves allow; they admit its consistence to be of the grosser oils; they have too many of them before in the extract, or they would never have foul beers; and that even the lees of wine would do as well, cannot be denied; and then, if the extract can be prevented running roapy, or condensing in the receiver, the season seems to be no kind of impediment.

When it is considered again, that high boiled beers cannot be subject to any absolute necessity of being worked in the wort-tun, but may have all requisite fermentation in the cask, where they

they may be kept much warmer; this so much counterbalances the severity of the season, as to bring the operation nearer to what is usually done when the temper of the air is more favorable.

If then we turn ourselves to the other extreme, and suppose we are brewing at Midsummer, it has been observed before, that gross oils foul the beer, and that there is an over quantity of such in the ordinary course of process, is allowed: it seems then happy, that a violent fermentation ensues; but if it be otherwise, how happens it, that yeast is used at all to give power to such fermentation? for if, by the heat of the season, the oils are so thinned, as to unimprison the acid salt, why will not fermentation ensue without the aid of yeast? These awakened spirits on the wing will necessarily act with vigor, and meeting but with a slight resistance, aptly produce a ferment, intimately tending to comminution; and if the oils and salts by this means amicably immix, the main purpose of the process is answered; it only remains then, that the drink be cleansed into the casks properly, receive what external air may be requisite, and
not

not suddenly chilled by too cool a situation in the cellar.

It may hence seem strange, that yeast may be thought necessary in either of the pre-mentioned seasons, as attended with a variety of bad effects, and not one known good property without it: what the artists call *yeast bitters*, and what every body calls headiness, is, without this subject, or similar substitute, totally unknown. There is much talk of *cocculus indicus*, grains of paradise, *daucus*, *calamus aromaticus*, and *melassus*, to poison the beer; yet most of these do less harm than yeast to make the drink heady, and some of them a real benefit.

The reasons of using yeast in general, I take to be, custom and impatience, and that it may in some measure contribute to rectify an error springing from a view of profit, by which, like what is said of the conjurers in ancient times, that raised spirits they could not always allay: but if it be true, as themselves admit, that the oils are generally too powerful for the acid salts, why may not a proper addition be administered in time, rather than be drove to the unhappy

happy alternative of either an excess of yeast, or aqua-fortis, and at last perhaps totally lose their beer, as that which may be easily corrected in the first instance, while all the fluid is in a kind of ferment, than when cooled into a stubborn opake body; or rather, why do not practiced brewers act so in the process, as not to need any of these reliefs; but where profit governs, or seems to govern, men seldom reason correctly, I wish I could say honestly, as the injuring the health of our labouring people is a kind of high treason against the community; but as men sometimes, in what are esteemed higher professions, set the example, unconvinced of evil, proceed without any regard to consequences; such are safe enough, whose ignorance or avarice dictate each motive of action, and are in some respects more excusable than such private persons, as that merely through custom, commit a gradual suicide on themselves, and ruin the health of their families, which must be the case with those, that will not take the pains to consider the evil effects of a notorious scorbutic fluid.

Spring

Spring drinks are generally required to be more than ordinary wholesome, the humors are then all afloat, and our passions at war with our minds: it is then that vines fluids act to most effect, as antiscorbutics, and all nature in a ferment: malt fluids then assume a spontaneous effervescence, and genial heat and moisture contend which shall have the best share in a happy production.

It is in this season that brewers may venture much farther than in the four preceding months, in the making of strong extracts, because of the vivid spirit of the salts, and readier commixture with the oils, opened and thinned by the emotion of the natural heat of the air, then more than at any other season peculiarly agitated; but it does not follow, that oils, even then, should be so forced from the malt and hop, as to impede that natural fermentation in liquors, which this season in so particular a manner encourages.

That Spring is a very good season for brewing, is out of the question, though not perhaps so good as Autumn; but this depends on weather, and what may be proper at one time in March, may at another

another be best in April, or even in May, as that month is sometimes very cold; but as that is uncertain, and the general probability against it, the rule is best in March; but if necessity engages us to defer it longer, a shrewd guess may be made, what the temperature of the succeeding months will be: if February be unusually warm and temperate, it commonly prognosticates a wet, cold, latter spring and summer.

The general reason for brewing in March is, as the weather is not usually so cold as to impede, nor so hot as to over-forward fermentation, and that the drinks may pass on cool through the summer, in which lights the season is singularly eligible; but as fermentation has been evidently shewn to depend on the acid salts having full play, and as these may be always obtained, either from the air or acid fruits, the relief is very easy and natural, and the superabundant oils so separated or commixed, as not to obstruct a due and proper comminution of parts, to such a degree at least, as that in the sequent season the acids may not rise too predominant.

The

The general opinion seems to be, that March is the best month for brewing pale untortured malts, as supposing the atmosphere then more replete with soft and kindly fluids than in October: that it is more replete with vapor, I have no doubt, but much question their superior soft and kindly nature, because of the frigid particles then usually remaining in the air, and even in some seasons to the conclusion of May; but that the succeeding summer may give such drinks a more meliorating quality, has some appearance of reason.

If any thing be wanted in pale malts, it is an additional heat to open and mellow them; but as that is artificially obtained in the extract, if then any harshness remains in the liquor, the summer air may in some measure assist to soften it; but this seems to me a resource of no very important use, if of any consequence at all.

It is certain, that the spring is usually selected for the brewing of pale malts, but such only more particularly as are intended for a summer beverage, or that are to come round early. Pale malts certainly make the best summer drinks,

drinks, and if not too highly forced, or contaminated with sediment, have a more vinos quality, and are less febrile than those extracted from a higher dried commodity, and in such case are never known to come foul or cloudy.

AUTUMN commands a certain advantage in the brewery, that no other season can equal; that is to say, soft water, fine air, and a cooling sequence. *October* is, in the order of nature, warmer than *March*; and if the latter summer proves fine, the most equal season of the year.

As in this month our latter fruits ripen to perfection, if any vinos fluids are requisite, they are then to be had fresh and fragrant; but pale malts are only to be used with them in mixed drinks, though always of use to correct the coarse oils extracted from brown malts, or to procure a spontaneous fermentation.

Brown malt extracts have the benefit of the ensuing season to gradually meliorate through a declining temperature for near three months, and to be in a kind of inert state for near three months more, when a ferment may again take place,

place, and carry them happily over the summer; and then, if not too high brewed, may be in a proper condition for fining and tapping.

Beers not coming round in this time, are either overburthened with malt and hops, or with coarse oils, or with altogether, and no true guess to be made when they will be in order; the liquor, well considered in the brewing for coming round about this time, makes it well suit the course of the ensuing winter, when it is rather drank as a kind of cordial than as a grateful beverage; and though the malts brewed from, and the hops used, be of the coarser kind, in this season, either the grape or morelli cherry will give it a vinos flavor, disperse all unctious foetidity, and that heady quality which ordinary ingredients are apt to form in the drink; and as the generality of the people are more under shelter in the winter than in opener seasons, more affected by the closeness of the air, and more subject to scorbutic habits than in summer, it would be very happy, if they could so contrive the management of their beers
for

for winter use, as to make them at once grateful and salutary.

The experiment often made upon that coarse acid melassus, and the resulting effect, may evince how much happier the consequence would be in the use of acid fruits, that are generally plenty at this time of the year ; but we see not our error, because gross oils will not expressly poison. Perhaps these hints, so often repeated, may put it into the head of some sensible brewer, to proceed upon a new plan, and by that means at once to recommend himself to the Public, and to Fortune. Autumn the best season, the experiment very cheap, as none need break in upon their substance, to experience the effects of mixing acid juices with our malt extracts, and of fermenting without yeast, the two most important points hitherto considered in the perfecting a salutary beverage.



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I N D E X.



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